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POPULAR Computing WEEKLY

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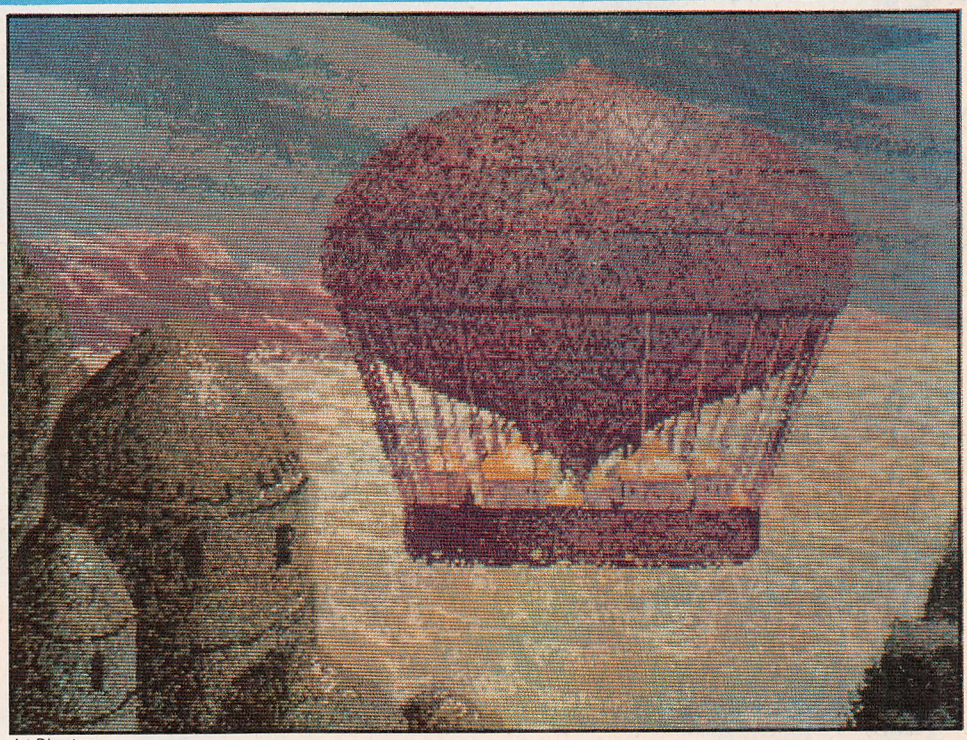

Art Director

Advanced Art Studio

ATARI · COMMODORE · SPECTRUM

SPECTRUM · COMMODORE · AMSTRAD · ATARI

AMSTRAD · COMMODORE · ATARI · SPECTRUM

N·E·W RELEASES

ROAD RUNNER

GAME OVER

WOOLWORTHS

A Great Deal in Entertainment

VISA

* At selected larger stores.

* Items subject to availabilty

COMMODORE · SPECTRUM · AMSTRAD

POPULAR Computing WEEKLY

July 31–Aug 6

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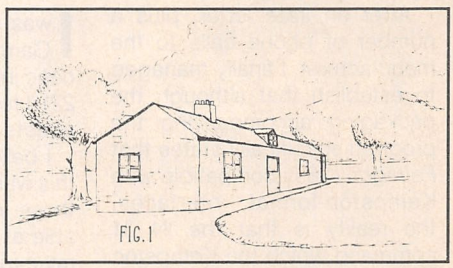

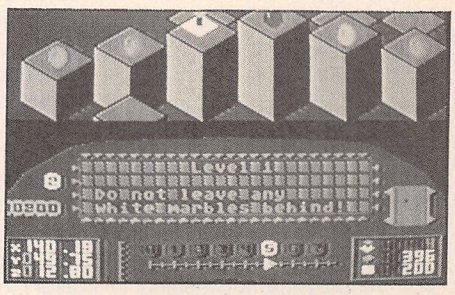

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ABC

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LETTERS

Incompatible Fairlight

Following T A Collins' letter regarding loading programs with *Fairlight* for the Spectrum, I feel that I should pass on my experiences with the 128K version of this program as a warning to him and other potential purchasers.

I bought a copy of this program in December 1986 for use with my (then) new Spectrum 128 and Kempston joystick interface, and discovered on loading, that although the program appeared to load satisfactorily, when any key or the joystick fire button was pressed, the computer crashed and reset to 48K mode.

I obtained a replacement program from my dealer, with exactly the same results. I then returned the replacement copy to the manufacturers after initially reporting the problem by phone.

Some six weeks later, another replacement program arrived – with the same problem, yet again, on loading.

At this stage, I replaced the joystick interface, on the off-chance that this was at fault, again with no improvements.

After an irate letter, plus a number of phone calls to the manufacturer, I finally managed to establish that although the packaging accompanying the program specifically states that *Fairlight 128* is compatible with Kempston-format interfaces, the reality is that the IN 31 command which the Kempston joystick interface generates is not in fact supported.

R K Northover
London E9

Extra commands tape

Thanks for publishing my C16 extra commands program. Perhaps you could mention that anyone not wishing to type in the program (it is a bit long) could send a cheque/PO to me at 67 Wrose Road, Five Lane Ends, Bradford BD2 1LN.

I will supply them with the program on tape with a couple of extra bonus programs, UDG generator/manipulator program and an automatic 'data' line maker program.

The cheque/PO should be for £2.50, made payable to Peter Finan.

Peter Finan
Bradford

The honest companies

Another good word for a couple of excellent companies in the computer business.

Having recently treated my C64 system to a disc drive, I contacted Tasman Software, which stated that an upgrade from tape to disc would cost £5.00. I duly sent off the cash, and received, by return, a fully packaged disc including full instructions.

The second company deserving praise is Compumart of Loughborough, which sells discs and disc boxes. Having already bought a 50 disc capacity box, I decided that I needed another.

Unfortunately, Compumart could not supply the product. Instead, the company sent me a 100 disc capacity box at no extra cost.

it gives me great pleasure to endorse these companies as examples of how simple courtesy and customer relations should be conducted

Keith R Munn
Glasgow

Hiding under the desk

I was interested to read Kenn Garroch's reply about magnetic interference (*Popular,* May 22). I too have suffered from the effects of this.

I believe in my case some of this was due to the use of one of those computing desks available at various stores. Perhaps my experiences may be of help to others.

I have a Commodore 64 with a C2N cassette unit, a 1541 disc unit and MP8801 printer. I use a small black and white TV for ordinary utility work.

I found after a while with the new desk that a number of tape programs which had previously loaded OK began to give loading errors. After cleaning and aligning the tape heads I found that most of the problems were solved if the C2N was on the floor under the desk!

On checking up in the C2N manual I note that it is stated that the cassette unit should not be closer than two feet from the TV or monitor, and in the Easyscript manual it says three feet.

On most of the desk units I have seen the restricted space means this is very difficult to arrange.

I got over the difficulty by adding a little shelf at floor level to the desk. I also have the cassette unit in a small earthed tunnel made of sheet steel.

This acts both as a magnetic and RF screen, and seems to overcome most tape loading problems.

I also had problems with the disc unit. I modified this with a mains power switch on the front so that it could be switched on conveniently without stretching over the back.

To make more room on the desk top I added a second shelf just under the desk top to take it neatly and tidily. I discovered that the shelf needs to be about eight inches under the desk top otherwise the unit gets abnormally hot in the restricted space.

Reginald A Mascall
Bristol

Calculating VAT

Perhaps users of the Amstrad PC1512 might like to try calculating VAT on the Gem Desktop calculator and committing it to memory:

a * 15 % M+,
then MR,

where a is 10, 100, and 1000 respectively. In each instance, the figure returned by the memory is 15!

Rev Thomas Scarborough
South Africa

The hidden pirates

I write about the hidden scandal of the computer users' groups. Because of the subject matter, please could you withhold my name and address, for fear of ridicule and retaliation.

I recently went to a few different user groups for the first time, to see what went on at these meetings. After initial suspicion the people there got down to the business of the evening.

Piracy. User after user, computer after computer. Virtually all that was done was to show off newly 'acquired' software, give copies out, then when everyone had a copy of everything they wanted, pack up and leave.

As a programmer, I found it totally disheartening that these people, covering a whole range of ages, did nothing but copy other programmers' work. To see people copying and playing my own games was also rather depressing.

I realise piracy goes on and nothing can realistically stop it totally, but these groups seem to bring it out of the seamy backroom and playground into the open, and even condone it.

As a non-member, I was asked to pay a visiting fee. I was then informed that I couldn't copy software unless I joined the group. This further encourages piracy, making it seem more acceptable to copy software, and deprive programmers of their livelihood.

I have been to various different meetings, for the Commodore 64 and Acorn computers. It was the same for each. One user even had a massive alphabetical list of his pirated software collection, letting members go through and pick out what software they wanted.

I asked some of the older hands if all user groups were like this, and they said they knew of no other type. Surely it is time to stamp out these piracy collectives and drive piracy into the shadows it deserves to be in. I stand to be corrected on the typicality of my experiences, and hope other user groups are different.

I somehow think that hope is a vain one.

Name and address supplied

Corrections from Rainbird

I am writing to thank you for the review of our new adventure, *Knight Orc* by Level 9 in *Popular* July 10–16, and to point out a mistake which has occurred about the price.

Knight Orc retails at £19.95 on the Atari ST and Amiga – not £24.95 as stated in the review.

I'm afraid the error in prices came from our end and so I would be very grateful if you'd print this letter to inform your readers of the correct price.

Just think though, instead of paying out £24.95 for *Knight Orc,* this brilliant adventure is available for just £19.95!

Also, the game *Tracker* is published by Rainbird, not Firebird as you stated last week.

Clare Edgeley
Public Relations Manager
Rainbird

Eprom 2 available

Your readers may be interested to know about the second issue of Eprom, the

Spectrum review magazine, following on from the well received first issue (mentioned in the letters page in June).

Eprom is the brightest new amateur based magazine in the country and is always glad of new readers, or contributions. To find out what the fuss is all about just send a 70p PO/cheque made out to Eprom, at 328 The Maltings, Penwortham, Preston, Lancs PR1 9FD, plus a postage stamp please. Sorry, no back issues of Eprom 1 available as it sold out after the last mention in the illustrious pages of this magazine (so send in your order for issue two now!).

T Worrall
Preston

"How about something for the weekend, Sir?"

Certain utterances

Firstly I would like to compliment you on the quality of PCW. I particularly appreciated the recent banishment of games to the back. I was however driven to certain utterances by something I read in the letters page of *Popular*, June 26.

A reader wrote asking where he, and "hundreds of other users" could obtain a two pass assembler for the CBM64. These do seem to be becoming rare, and you replied that Supersoft were "still selling" their Mikro assembler which costs £57.50. So why the utterances? Well, the previous PCW carried a news item about my companies RS232 interface and 6502 assembler package for the 64. The latter costs a mere £12.99 and is somewhat better value for money in this age of budget software.

A Holme
York

Solving the puzzle

A number of new readers have contacted us recently asking for a fuller explanation of the rules and conditions for entering the Puzzle which appears on the inside back page each week.

For them, and also as a recap for seasoned Puzzle solvers, here is a full list of, well, hardly 'rules' as such; let's call them guidelines. They should answer all the queries we've received recently.

Conditions of entry

1) The closing date for the each puzzle is given every week. As you have around three weeks to send your entry in, feel free to save postage by putting solutions to two or three puzzles in one envelope.

Just keep the different puzzle solutions to separate sheets.

2) We do not need (nor want) your solutions on disc or cassette. We do not have time to run them all each week, and we would probably get snowed under trying to return disc and tapes to their rightful owners.

3) We do need the listing of the program you used to solve the puzzle. You can send a computer print-out, or if you don't have a printer, type out or handwrite the listing (legible handwriting, please).

4) Please write the actual answer to the puzzle somewhere on your entry, either output as part of the program, or written underneath.

5) Also, you should include short program notes – show your workings!

Judging

1) The winner will normally be the person who submits the most concise, clear program, which accounts for the elements of the question set, and produces the correct answer.

2) This does not mean you need to own a computer with awesome programming powers. We make allowances for the machine used, and the different capabilities of various computers.

3) While we can usually tell from the listing which machine, or machine type has been used to generate a solution, it helps enormously if you can note the computer used in your entry.

4) Entries from those who solve the puzzle without writing a computer program will not be disqualified, but they do start off at a disadvantage.

Most, if not all the puzzles are most sensibly solved using a computer, Besides, the puzzle is not intended to test phenomenal power of mental arithmetic, but to challenge you to write the neatest computer program which solves it. This *is* computer magazine, after all.

5) The winning solution does not have to be identical to that given by puzzle setter Gordon Lee's – again to take different machines into account.

6) If no correct solution is submitted for any one puzzle, then no prize will be awarded for that puzzle (it has happened!).

7) If there are several clear, concise, correct solutions for any one puzzle, which, in the opinion of the judges, cannot be separated, the winner will be drawn at random from the final shortlist. There is only one prize awarded each week.

8) The judges' opinion is final.

9) Puzzle entries should be sent to Puzzle No XXX, *Popular Computing Weekly*, 12–13 Little Newport Street, London WC2H 7PP.

Correction

Here are the elusive missing lines to our Spectrum listing, A Game of Two Halves, which was to have appeared last week.

```
408 IF u$="i" AND match=0 THEN  LET cpf
ix=INT (RND*2): LET crd=INT (RND*48)+1:
LET m$=v$(crd): LET j$="***  FA Cup Matc
h  ***": IF i$(crd)="o" OR v$(crd)=y$ TH
EN  GO TO 408
```

We're sorry but *Popular Computing Weekly* cannot guarantee to reply to *all* letters requesting a personal answer. It helps us enormously if readers are prepared to have general queries answered on these pages, so, if possible, please do not send SAEs.

The mating threat

In Game Two of our readers' versus *Colossus* chess tournament, the readers, playing white, moved their rook to g3, probably hoping to threaten mate with their queen on b6. *Colossus* has, however, avoided all that by just moving its king out of the way to f8 (see diagram for latest positon).

Apologies are due for the misprinted Game Two board position last time. The pawn shown on c6 should, of course, have been a rook.

Also, could readers please use full algebraic notation specifying both squares for their move, to avoid any possible confusion?

Over to you

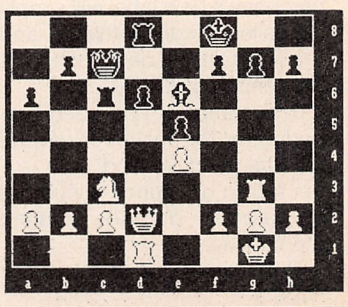
What do you think would be the readers' best move now?

Send your suggested move to *either* Inter-Mediates (*Popular* Chess), Freepost, Sawbridgeworth, Herts CM21 9YA (no stamp needed), *or* *Popular* Chess, Unit 2, The Maltings, Sawbridgeworth, Herts CM21 0PG (with a stamp).

Only one vote per person please, and all entries must reach either address by Wednesday, August 5.

Game Two

1	Pe2-e4	Pc7-c5
2	Ng1-f3	Nb8-c6
3	Pd2-d4	Pc5xd4
4	Nf3xd4	Pe7-e5
5	Nd4-b5	Pa7-a6
6	Nb5-d6+	Bf8xd6
7	Qd1xd6	Qd8-f6
8	Qd6-d1	Ng8-e7
9	Nb1-c3	Pd7-d6
10	Bc1-e3	Ke8-g8 o-o
11	Bf1-e2	Bc8-d7
12	Ke1-g1 o-o	Rf8-c8
13	Qd1-d2	Nc6-d4
14	Ra1-d1	Nd4xe2+
15	Nc3-e2	Rc8-c6
16	Be3-g5	Qf6-e6
17	Bg5xe7	Qe6xe7
18	Ne2-c3	Bd7-e6
19	Rf1-e1	Qe7-c7
20	Re1-e3	Rf8-c8
21	Re3-d3	Rc8-d8
22	?	
23	?	



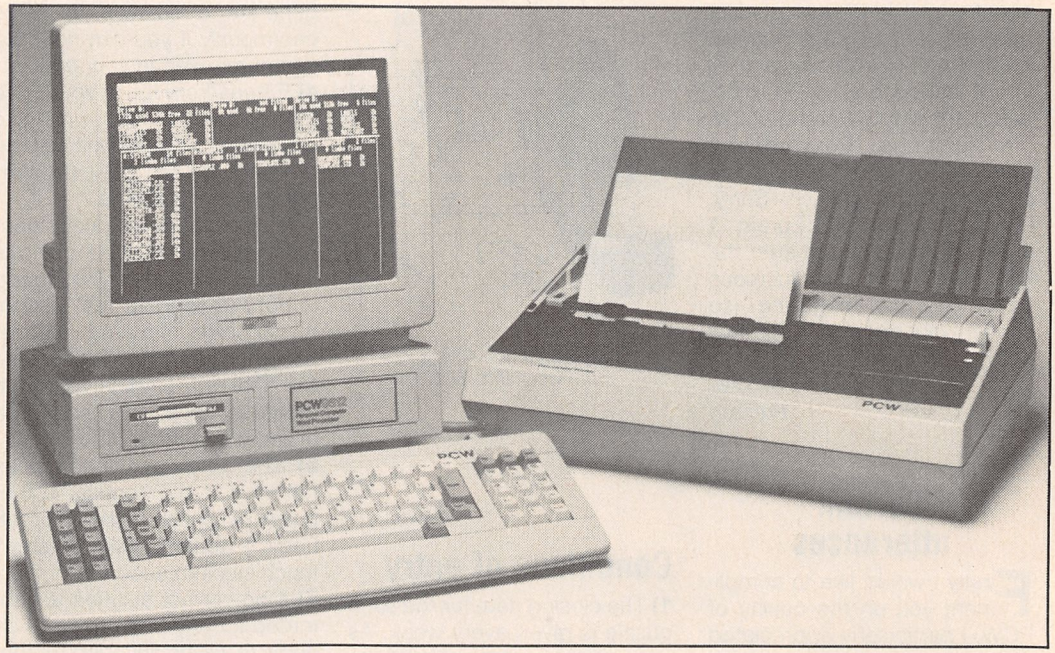
New PCW gets daisywheel

AMSTRAD last week launched its new PCW9512 wordprocessor at the NOMDA office equipment exhibition in Atlanta, USA. The new machine will make its UK debut at the *PCW* show in September.

The 9512 costs $799 (about £500). Although UK prices will not be announced until the September launch, a £499 price tag looks likely.

The machine differs substantially from the hugely successful PCW 8256/8512 which preceded it, and features:

- a system unit containing one 3 inch disc drive, with an optional second drive.
- a 20 cps letter-quality daisy wheel printer.
- a paper-white monitor.
- 512K Ram.
- bundled *Locoscript II* wordprocessing software.
- *Locospell* spelling checker.
- *Locomail* mailmerge software.
- Parallel Centronics interface, for connection to four other printers.
- Optional CPS 8256 serial interface.
- 15½ inch auto paper and tractor feeds.



Amstrad's new PCW 9512 with daisywheel printer

Amstrad insists that the earlier machines are not being dropped, despite persistent speculation about their future.

"We will continue to supply our previous PCW models, as we feel that there will continue to be a strong demand for them," said Amstrad marketing chief Malcolm Miller.

The most likely result of the 9512's arrival – and particularly the inclusion of a daisy wheel printer – will be £100 price cuts on the 8256 and 8512.

Virgin label targets Yuppies

Nicky & Dicky: Virgin's Nick Alexander & Richard Branson

DETAILS emerged last week of Virgin's first moves out of the games software market. The company's new label will simply be called Virgin Software, and the first title will be launched at September's *PCW* Show.

The company has been preparing for the move for several months, and indeed was expected to announce a number of business packages during the summer.

But Virgin's Patricia Mitchell made it clear that the new label will definitely not be producing spreadsheets, wordprocessors or other traditional business programs. Nor would there be any "adult games".

"It's more home-based entertainment," she said. "We're trying to get people who have used a PC at work and have a cheap PC at home.

"It's for people to use a PC to do something more useful than play games," she added. One example would be a stocks and shares portfolio manager.

Mitchell was able to confirm only a few details, but she did say that Virgin is working on half a dozen products for the new label. Initial Virgin Software titles will carry a £50 price tag.

She also stressed that Virgin Software had no plans at the moment to cater for machines such as the Macintosh, but would produce titles solely for PCs.

Kempston outfit bows out

KEMPSTON Micro Electronics, manufacturer of Amstrad peripherals, has gone into voluntary liquidation. Peripherals marketing operation Kempston Data will continue trading, and is unaffected by the move.

KME founder Abta Pandaal was philosophical about the closure of the five-year-old company, which had actually stopped selling products last summer.

"That market has gone and we've moved on into other things. There's a very long list of manufacturers who have fallen into the same trap. The past is the past and there's not a lot you can do about it," he was reported as saying.

Plus 3 price cut on cards

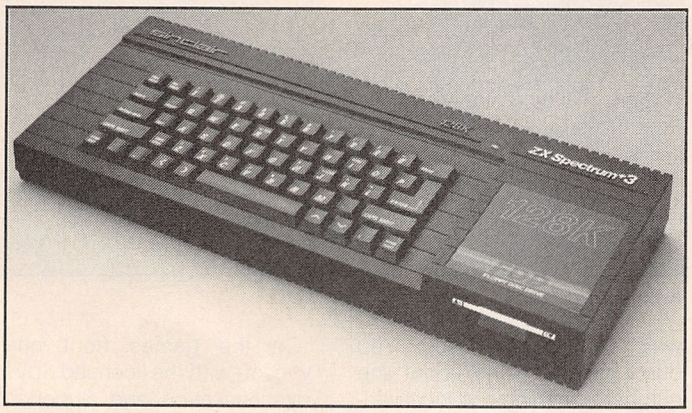
A £50 price cut for the Spectrum Plus 3 was being predicted last week, with an announcement expected between now and Christmas.

Speculation arose once the £249 price tag for the Plus 3 – which goes on sale this week – was known. This was a lot higher than had been expected, and was considered far too high by many, given the 128K storage and comparatively low specification of the new machine.

But recent events may have forced the issue. Atari's announcement of a £100 cut in the price of its 520STFM from September 1 – to £299 – made the Sinclair appear uncompetitive, and W H Smith has already announced it will not be stocking it.

Secondly, it is thought that a mid-range Spectrum – a "Plus 2A", or Plus 3 minus a disc drive – could be announced shortly. This would force a cut in the price of the Plus 2 as well. But last week Amstrad was dismissing all talk of any price cuts.

"We have no plans to cut the price at this time," said a spokesman. Asked whether any move would be announced by Christmas, he replied: "It is not, and never has been, our policy to talk about marketing strategy in advance of announcements."



Spectrum Plus 3: £199 by Christmas?

Online bonanza for US hackers

HERE'S a good story. It's about these teenage computer hackers in ten US cities who access credit card numbers and bank records to go on an online spending spree – and get into the national security network.

But it's not *War Games 2,* it's a true story. According to a report in *The Guardian* last week, police and secret service agents in Pittsburg uncovered the ring after one teenager's mother was curious about where he got an expensive skateboard.

But it turns out that it didn't end at skateboards. Clothes, TV and hi-fi worth thousands of dollars was bought through the illegal bulletin board which covered the whole country. The hackers only stopped short of the ultimate – a car.

Secret service officials were reportedly tight-lipped about the possible danger to national security posed by the youngsters.

"We have no knowledge of any teenagers invading the government security system," said one.

SOFTWARE HOTLINES

The next month or so is going to be a good time for owners of STs and IBM compatibles who like games by **Ocean,** but it's slim pickings for the rest of us at the moment.

Most of the major software houses are now concentrating their efforts on the *PCW* show in September, so there's not a vast amount of interesting new stuff on the way, although there is a lot of converting across formats going on.

ST owners can look forward to the arrival of *Tai-Pan* (yes, really), *Slap Fight, Top Gun* and, perhaps the most interesting arcade release so far for the ST, *Head Over Heels.*

Top Gun will also surface in a PC compatible version, as will *Tai-Pan* and the totally addictive *Arkanoid.*

Down at the Spectrum and C64 end of the market, yet more licensing deals are behind two of the more interesting games on the way.

Gremlin Graphics has almost completed *Mask,* an arcade adventure based on the popular comic strip. It's one of those *Man From Uncle* type scenarios, where organisations with names made out of lots of initials battle it out for control of the world using hi-tech gadgets to chase each other around and blast each other to bits with.

It was supposed to be ready for July release, but it looks like August is more likely at the moment.

Over in America, Arnold Schwarzenegger's latest film is raking in lots of money, and **Activision** has grabbed the software rights. The film is called *Predator,* and someone at Activision described it as "a cross between *Southern Comfort* and *Alien*".

Arnold and his biceps go into the southern swamps in search of some kidnapped diplomats, and then end up being chased by a thingy from outer space. Somehow I get the feeling that it might just be a shoot 'em up.

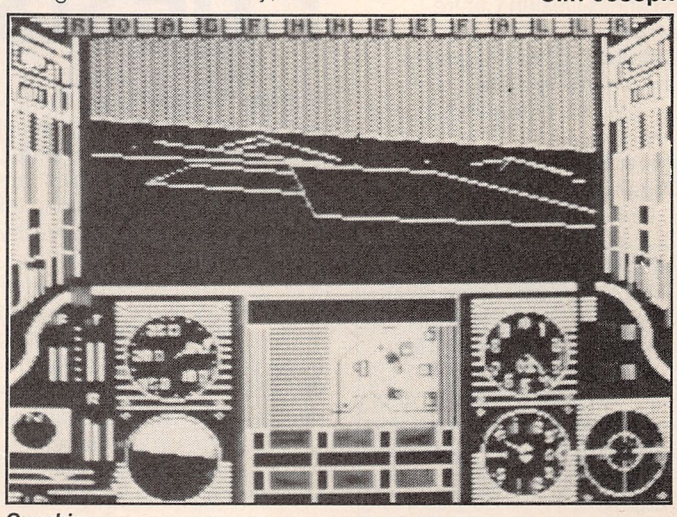
In a slightly more cultured but no less violent vein, Activision will also be releasing the Spectrum version of *The Last Ninja* soon, and that will be quickly followed by *Ninja's* sequel, *Bangkok Knights,* based on the art of Thai boxing.

Another piece of bicep rippling software on the way is *Captain Courageous* due soon from **English Software.** Like *Predator,* it sounds like it owes a bit to the *Rambo* films as it's described as a game of 'hair-raising jungle combat' with a great deal of splashing across rivers and swinging from tree to tree, but *CC* will only be available on the C64.

Now, with the arrival of the Plus 3 only a few days away, we're starting to get a few confirmed titles for the new machine. Many companies are 'thinking about' disc-based games, but so far only **Microprose** has definitely announced one with release dates and prices. Its *Gunship* helicopter simulation has sold bundles on the C64 and from August should be available for the Spectrum in both cassette and disc version.

And that definite price? £12.95. So you've now got some idea of how much the games are going to cost you.

Cliff Joseph



Gunship

Archie steals Show

THIS year's *Acorn User* show attracted the crowds in greater numbers than usual, and it was all because of one machine. For the first time in public Acorn had the Archimedes, the RISC technology-based machine, on show.

Although no commercial software was in evidence for the machine, a number of demonstration programs did give a glimpse of the speed and power of the Archimedes. David Braben's *Lander* game in particular, with its scrolling three dimensional solid landscape, impressed.

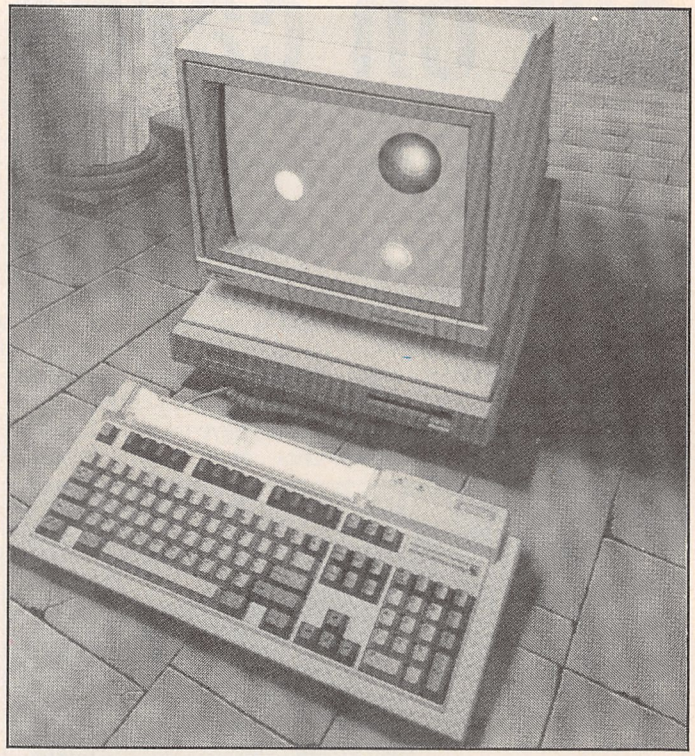
Computer Concepts was quick off the mark in the support stakes for the Archimedes with ARM (price £12.95), a book on assembly language programming, while Norwich Computer Services was offering subscriptions to *Archive,* a magazine for the Archimedes.

New hardware for any of the existing Acorn machines was thin on the ground but Vine Micros did have *Romboard 4,* which allows you to store four Roms and choose whether to overlay the Ram banks or the cartridge slots. Nidd Valley Micro Products had a mouse, which can be used on its own or with their *Grafik* mouse software package, total price £39.90.

The same company was also demonstrating *Desktop Illustrator,* a package for producing designs to be printed. £49.90 including a mouse. In a similar field, Wight Scientific were showing *Signwriter* (£29.95), a program for instant display lettering.

For doing their own programming an interesting product was Elsevier-Biosoft's Overlay Basic (£29.95). This comes as an Eprom and allows users to keep Procedures and Functions as library subroutines on disc. It does this by intercepting error reports and searching the disc for the appropriate routine which has been called. You don't have to worry about line numbers clashing and local variables remain so.

For more advanced programmers Mijas Software were exhibiting Source-Level Debug (£22 for basic system, new Debug disc at £20), a tool for debugging assembler and C programs.



Archimedes

On the games front only Tynesoft with the licensed *Spy v Spy* conversion and Superior/Acornsoft with *Crazy Rider* – something like *Pole Position* on a motorbike – had anything new.

With little else at the Acorn User Exhibition as exciting, Archimedes more than stole the show – it was the show.

Duncan Evans

DIARY DATES

SEPTEMBER

23–27 September
Personal Computer World Show
Olympia, London
Details: Latest hardware, software and peripherals for business and leisure computing
Price: £3, £2 – (parties over 10)
Organiser: Montbuild
01-486 1951

OCTOBER

15–17 October
Desktop Publishing Show
Business Design Centre, London
Details: Demonstrations of latest hardware and peripherals, plus seminars and user clinics
Price: On application
Organiser: Database Exhibitions, 061-456 8383

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.

Priests 'n' PCs on TV

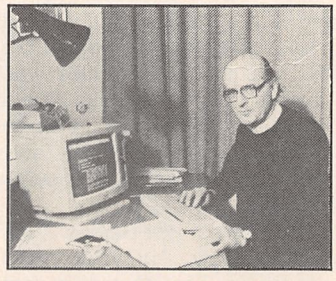
COMPUTER "duffs" are the target of a new series on Channel 4, *So We Bought a Computer.* The six-part series, which began last Monday, is aimed at people who are "frightened by computers".

"You needn't know the internal workings of the combustion engine to learn to drive a car, and it's the same with a computer," said presenter Carol Vorderman, who also appears on C4's *Countdown* programme.

The series covers different areas of computer applications in small businesses, from word-processing in the first programme, to databases, spreadsheets, graphics, communications and computers in retailing.

Each programme features interviews with a number of users, none of whom are experts, including the priest who uses an Amstrad PCW for writing sermons, and the fruit farm owner who works out payroll on an IBM PC.

There is also an interview with an "expert", who answers basic questions about choosing systems for particular applications.



Very Rev. John H. Allen (Provost of Wakefield)

So *We Bought a Computer* is on Channel 4 every Monday at 6.30pm.

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'Whaddya mean, you sold the last copy?'

No doubt about it . . . bulging eyes, flaring nostrils, face contorted in rage, literally smouldering with frustration.

Another ordinary ST user has missed out on *ST Update.*

Trouble is, in its first few months *ST Update* has been a monstrous success. There's simply no way you can be sure that there'll be a copy for you, unless you order one today.

It's too late after the event. Tearing your newsagent's arm off and beating him to death isn't going to help.

Save yourself the anguish. Just ask him nicely to keep your copy safe each month.

Ads watchdog savages computer industry again

THE computer industry's bad name for misleading advertising hasn't been helped by the latest report of the Advertising Standards Authority.

Complaints were upheld against no less than five computer companies for a variety of failings. The most publicised of these companies was Cambridge Computer, which received criticism for its advertising of the Z88 portable (see *Popular Computing Weekly*, July 3).

KK Stationers of London's Edgware Road was investigated over prices the company quoted for the Psion Organiser. KK had advertised the Psion at £82 for the Organiser II-CM, and £115 for the XP exclusive. So VAT-inclusive prices should have been £94.30 and £132.25.

A customer at the shop was told that inclusive prices were £99.50 and £139.50, but the company later admitted to the ASA that the customer had been misinformed, and that the advertised prices were correct.

Non-appearance of advertised products was the reason for an ASA verdict on Mirrorsoft. The Authority upheld a complaint about the *Fleet Street Editor* DTP program.

This was being advertised in the computer press in November 1986, but was still unavailable in March 1987, although it did appear in April. The ASA asked Mirrorsoft to avoid such a delay in the future.

A similar problem got Nabitchi Computing of Liverpool into trouble. A customer questioned the continued advertising of the Locoprinter daisy wheel driver for the Amstrad PCW 8256, when she was repeatedly told by the company that it was not yet available.

Nabitchi claimed that supply problems had caused a shortage, but were reminded by the ASA of the need to ensure the availability of products before they were advertised.

The final complaint was over claims of a split baud rate for PMS Communications' Dialup comms package for the IBM PC and compatibles.

Promotional literature failed to make it clear that the split baud rate could only be achieved on the PC by using a speed-buffered modem, and the ASA decided that this qualification should have been expressed in the brochure.

The ASA report shows a continuation of the bad record of computer companies in promoting their products. The industry consistently falls foul of the Authority, and is rivalled only by the holiday and financial services industries in complaints about its advertising.

Psion emulator for PCs

PSION has launched a software development emulator for writing OPL (Organiser Programming Language) Programs for its successful Organiser II handheld computer on an IBM PC.

Psion – which is currently producing 2,000 Organiser IIs a week – reckons the Developer will make it easier and quicker to write OPL programs.

"It's for any people that currently use OPL on an Organiser, and have a PC, from the likes of you and I to people in big corporations," said a Psion spokeswoman.

What sort of applications would Psion expect people to develop with the new product? "It could range from writing alarm procedures to much more complicated procedures – absolutely anything."

The product – on a $5\frac{1}{4}$ inch floppy disc – enables the PC or compatible to operate as a complete replica of an Organiser, but with a full-size keyboard and inbuilt screen editor.

Procedures can be stored in MSDOS files on disc, and then transferred to the Organiser's Datapaks using the recently-announced BS333 Commo Link. The product will run on all IBM or compatible PCs with 512K Ram and MSDOS 2.0 or later.

The Organiser Developer costs £49.95 (including VAT).

Enterprise is back

ENTERPRISE Computers looks set to make a return to the UK market, nine months after the company folded its UK operations.

Former Enterprise executive Neil Blaber is currently in discussion with the firm's new owners in Germany, but hopes to be acting as the firm's UK agent shortly.

"Enterprise is not officially moving back into the UK yet, but it might be," Blaber said last week. "But I'll be carrying the full back catalogue of software and selling the machines and peripherals."

It appears that many new titles from Germany, not previously available in the UK, will reach the UK market under the deal.

The Enterprise story dates back to 1983, when the company was called Samurai Computers. The name was shortly afterwards changed to Elan, and the Elan Enterprise announced.

The company swiftly changed its name again, to Flan, and finally to Enterprise. Meanwhile the machine, announced in late 1983, didn't actually appear until the 1985 *PCW* show in September of that year.

The British company's assets were bought up by an Indian company, Broadlight, and have now been bought by the German company.

Blaber reckons that prices for the Enterprise will still be "fairly competitive" – about £80 for the 128K machine, and £60 for the 64K.

NEXT WEEK

Desktop publishing

Next week sees the start of a two part feature on this year's fashionable topic. We'll look at what's available, what effects you can expect, and why desktop publishing on the small micro still has some way to go.

Lisp

Kenn Garroch begins a new series on learning Lisp – which stands for List Processing. Created as an artificial intelligence tool, Lisp has very few commands, but uses them to 'process lists' of data, hence its name.

Games consoles compared

The Sega, Nintendo and Atari 65XE are all vying for places in the high street stores, as the return of the games console looms. We look at all three and explain what the consoles have to offer the games enthusiast.

The silly season

Why do so many companies go to the wall during the summer? We look at the effects of the micro 'silly season'.

Machine code programming

Spectrum owners who'd like to improve their machine code should take a look at Andrew Styles' article, hints, tips, increasing the speed of programs and saving memory.

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Copy and be damned

Christina Erskine assesses the impact of the new Bill which aims to overhaul the 30-year-old Copyright Act later this year, and finds the Government has caught the industry on the hop.

THE 30 year old law of copyright is due for an overhaul in a government Bill this year.

The new Bill is at the white paper stage at the moment and is due to be laid before the House of Commons in November.

Obviously not all of it concerns computer software copyright, as a piece of legislation with about 20 different sections, covering the whole issue of intellectual property rights. But one aim of the Bill is to reinforce the relevance of the copyright law to software, as covered by the amendment to the Act in 1985.

The controversial 10 per cent blank tape levy will apply only on tapes with a total playing time of 35 minutes and longer.

"It will allow people to make sound recordings for their own purposes, but it does not cover computer software," said a spokesman for the Department of Trade and Industry.

But Bob Hay, head of FAST (Federation Against Software Theft), which has secured convictions against software pirates under the copyright law, believes that the tape levy, if implemented, will be "quite detrimental".

"Will the public be discerning enough to say they can tape off the radio, but not computer software?" he said.

"It seems to be saying that copying isn't a good thing, but for an extra 10 per cent it's okay."

However, the new law does go some way to protect software; a clause in the current draft version states that copyright, as well as covering the written word and broadcasts, also refers to "other works in non-human readable form". This phrase, according to the DTI, is being included specifically for computers.

Works in "non-human readable form": computer software – in whatever format – comes clearly within the bounds of copyright in the new Bill

"The law will confirm that computer software definitely comes under copyright protection. Storing information in a computer is a form of reproduction which cannot be copied without the owner's consent.

"The phrase also refers to work typed in at a keyboard without being produced on paper first," the DTI spokesman said.

One area of particular concern to FAST and a number of software houses is that of 'software libraries', or hiring out programs.

The computer industry's point of view is that in practice, software hired is almost invariably copied before being returned. In the case of many disc-based programs, of course, you are strongly advised by the publisher to make back-up copies. Here, once the hired master discs are returned, you still have the back-ups – not the purpose backing up discs is intended for.

However, the new Bill does not, at its present stage, specifically make provision for legislating against software rental.

FAST, for one, hopes to bring some influence to bear. "We'll pursue the rental question at the committee stage of the Bill," affirmed Bob Hay.

In general, however, Hay welcomes the Bill, and feels it should clarify and improve the current situation, but there are a number of additional points he would like to see addressed.

"We'd like the burden of proof on the part of the author to be lessened; we want improved powers for Customs and Excise people relating to importing; we're pushing for rental rights to be determined by copyright owners," he said. He added that he believes that the film and video industry would also welcome the last point.

The new Bill should become law sometime in 1988. While it is not politically controversial and should receive a measure of all-party support, its very length means that it will probably take some time to go through from its initial introduction in November.

We contacted a number of software houses, particularly those known to have suffered from the activities of pirates in the past, to find out what they thought about the impending changes.

Unfortunately, those that we spoke to appeared to be unaware that the overhaul was taking place, although they indicated that any change in the law that put computer software firmly under the aegis of copyright was to be welcomed.

Despite the fact that a private member's Bill in 1985 passed an amendment to the Copyright Act, specifically including software, both the DTI and software companies felt that the 'double confirmation' that the new Bill will give was desirable.

Advert prepared on an Atari 520STFM using "Publishing Partner" and printed in one pass on a QMS PS800 Laser Printer

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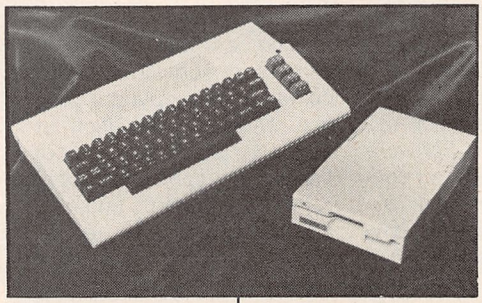

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2-BIT PERFORMANCE FOR YAMAHA

Clive Watts explains how one small piece of software from Accessories Etc. can change your Yamaha from a back bedroom plaything to a high-tech performer.

The Yamaha FM-Tone modules SFG01 and 05, made for use with the CX5 or other MSX computers, are capable of producing some breathtaking musical results. Most of the available software, however, is designed to allow data to be programmed into the system for subsequent automatic playback, and is not so suitable for real-time performance. The built-in "Call Music" feature overcomes some of the limitations, but is still lacking in many real-time performance controls – in particular expression; tremolo/vibrato and sustain.

BIT 2 is a program written by David Pearce and published by Accessories Etc. which is designed to provide these controls, together with many other desirable features. To make use of all these extra facilities, a sustain pedal and a special type of joystick are required. Both can be supplied at modest cost by Accessories Etc.; alternatively the DIY buff can easily construct the necessary add-ons from the instructions in the handbook supplied with the program. One of the YK keyboards (YK-01,10 or 20) is also needed.

With BIT 2 it is possible to program up to 20 performance memories with voice and parameter combinations, any of which can be recalled at the touch of one or two keys. Pressing any of the numeric keys 1–9 & 0 will recall Performance memories 1–10. Pressing SHIFT and the appropriate numeric key recalls memories 11–20.

The main display shows one of the Performance memories at a time, selected as above. Each memory defines four "instruments", labelled INSTR.1/2/3/4, together with all the parameters that go to make up the desired sound recipe. Each instrument is defined by the name and number it has in the voice file.

Once the instruments for each memory have been defined, the way in which they are combined and controlled can be examined. In the lower left corner of the main screen is a panel labelled "SYSTEM". Under this are four parameters which will affect all the instruments in that performance memory. Firstly, MODE (1–9) determines how the four instruments in the memory are combined. Mode 1 allows eight notes polyphonic play on INSTR.1, INSTR.2, 3 & 4 are not used; Mode 2 allows four notes polyphonic play on INSTR.1 & 2 simultaneously (dual voice); Mode 3 allows four notes polyphonic play on both INSTR.1 & 2, INSTR.1 to the left and 2 to the right of a determinable split point.

Mode 4 allows two notes polyphonic on all four instruments; Mode 5 allows two notes on each side of a split point, each on two instruments. Modes 6–9 allow various combinations of notes to be played on the keyboard simultaneously with the simple built-in sequencer.

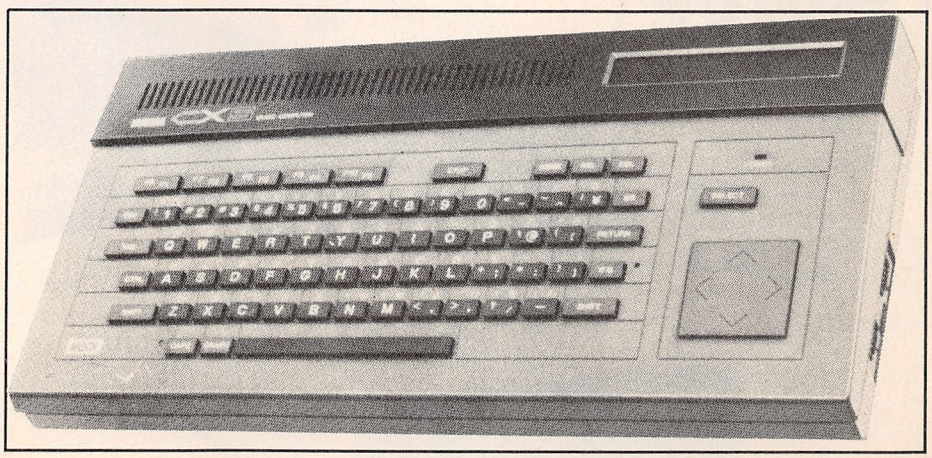
The sequencer permits a simple melodic phrase of up to about 100 notes and rests of equal length to be entered. Rhythm can be constructed by careful use of rests, and although strictly limited in its scope, the sequencer can be used to good effect. I found that entering a simple round (Frere Jacques) and triggering the sequence in several different octaves at suitable time intervals produced a pleasing effect. The sequence can be triggered either by a key on the keyboard, or by the Select key on the computer keyboard; it can be set to play once only or to repeat continuously; it can be set to always play in the key in which it was entered or to transpose to the key of any note played, or to remain in the same key but to start on the note played, thus giving a sort of modal effect.

An attractive feature of the program is the ability to move voices from file to file. It is a simple matter to create a new voice file using some voices from the Preset file, some from the User file and some from the Alternative file. The User and Alternative voice files can be saved together with Performance memories, thus preserving their usefulness. (It is advisable to make Performance memories 1–10 call voices from the User voice file and Performance memories 11–20 call voices from the Alternate voice file.)

At £20 for cassette and £25 for disc I consider the program offers excellent value for money. It also gives a sensible and balanced set of alternative resources which greatly expands the capabilities of the Yamaha FM Tone Module. I anticipate making good use of it in my future music making.

Clive Watts

Program *BIT 2* **Micro** Yamaha CX5 and other MSX micros compatible with SFG-01 and -05 FM tone modules. **Price** £20 cassette, £25 disc **Supplier** Accessories Etc, Box 566, Newport Pagnell, Bucks MK16 0NW.



The Yamaha CX5

GIVING YOUR AMSTRAD THAT EXTRA DRIVE

David Wallin weighs the pros and cons of adding a second $5\frac{1}{4}$ inch disc drive to your PCW.

The PCW machines have now gained credence as fully fledged computers, as opposed to electric typewriter substitutes. So it's no surprise that the conventional peripherals have begun to appear for them.

One of the obvious add-ons for a PCW8256 is the addition of a second disc drive. While you can upgrade to a second 3 inch drive through Amstrad itself, you can also opt for a $5\frac{1}{4}$ inch drive through several manufacturers, including Pace Micro Technology.

The cost of different drives is about the same, but adding a $5\frac{1}{4}$ inch drive to your PCW set-up has some not immediately apparent advantages.

Moulded in cream coloured plastic, the drive is strong enough to support the monitor of the 8256, yet light enough to carry around by hand. The entire unit has just two switches, an LED and a catch. One switch is an On/Off switch, the other a 40/80 track select. The LED shows when the drive is in use (as does the drive A LED) and the catch locks the disc in place, releasing it when opened (again, as does drive A's) simplicity itself, as is the manual.

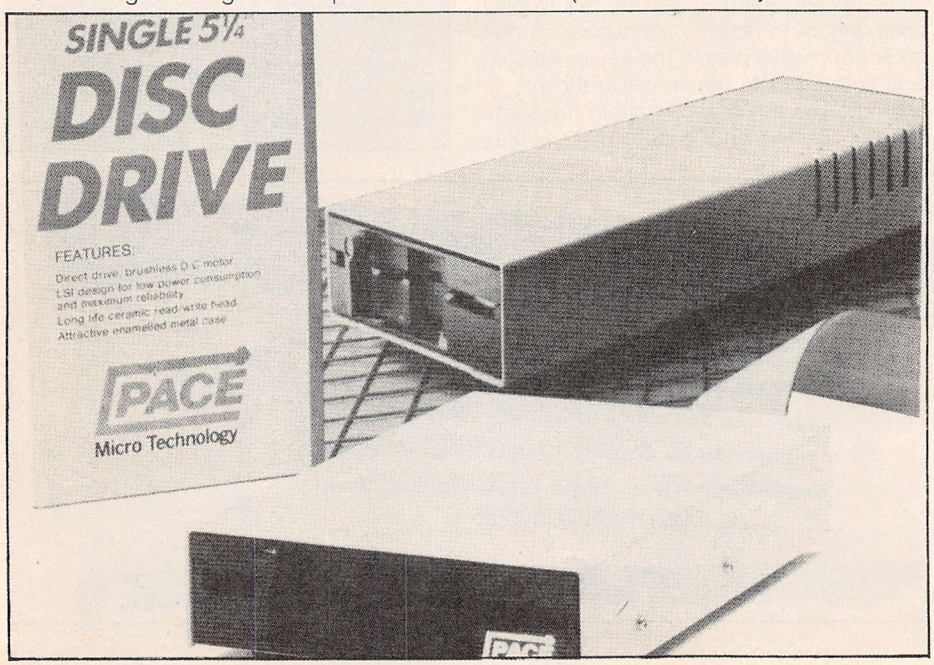
Consisting of a single folded piece of A4 card, one page tells you how to plug the drive in and format discs and the other how to use TDOS (more in a minute).

The six stages to connecting the drive are easy to follow. Initially you are told to lay the monitor face down on a flat surface. I found the best surface to be a firm mattress as it has a small amount of give in it. Having removed the rear of the case, you have to locate the internal second drive ribbon (with the case open, it will stare you in the face).

This has to be fed out of the case, through the same slot as the printer interface emerges from. The unit is re-assembled and the end fo the cable connected to the cable on the disc drive. A five minute operation if that (it can be a bit fiddly to get the cable through the case).

The power lead has to be plugged into the mains, and it even comes complete with its own plug. The drive is now ready to use. You have to switch the drive on before turning the computer on otherwise the computer does not know it's there. This is useful when you want drive B to be drive A, as it were.

With the 80/40 track select set to 80, each disc can be formated for 800K with Diskit (some users may have an old version of CP/M and if this is you, you need to get the latest version. The old version does not recognise second drives properly – I did have this trouble, but Pace knew exactly what to do. The upgrade is free on return of the original disc).



The second page of the manual is about TDOS.COM. TDOS.COM is supplied on a $5\frac{1}{4}$ inch 80 track disc. Once loaded, it will enable you to transfer MSDOS or PCDOS files to CP/M once compatible with the Amstrad. You cannot run MSDOS or PCDOS programs, but you can use data created under those DOSs.

For example, a test file created on an Amstrad PC1512 could be converted to a text file on the 8256, but the text editor used on the PC cannot be converted for the 8256. Even files such as *Wordstar* ones with control codes can be converted to CP/M without corrupting the codes.

Therefore a *Wordstar* file created on a PC1512 can be converted to a *Wordstar PCW* file and all the control codes will still be there. OS change (Operating System change) of a file is the only time when the 40/40 track switch will need switching to 540 tracks as most IBM machines use 40 tracks. Do not forget to switch back!

I had just one problem with the drive. The discs can be very temperamental. The PCW manual advises that you do not switch the computer off with a (3 inch) disc in the drive. In reality this rarely has any ill effect. With $5\frac{1}{4}$ inch discs it can be a far greater problem.

Overall, I consider the drive to be worthwhile as well as economical for a user with lots of discs. It's priced very competitively with other $5\frac{1}{4}$ inch drives, comes with reasonable software and is remarkably easy to fit and use. The On/Off switch I consider to be invaluable and the fact that the interface is housed in the case with the drive means there's no awkward fitting as with some drives. Highly recommended – I don't know what I'd do without it.

Product *Pace* $5\frac{1}{4}$ inch second drive
Micro PCW 8256 **Price** £190.90 inc VAT
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ARTISTIC DIRECTION

Over the last three weeks Paul McKinley has been suggesting ways in which you can get the most out of graphics packages. It's one thing to see wonderful demonstration pictures; quite another to reproduce them yourself.

However, if your appetite for trying out some of Paul's ideas has been whetted by our series, why not take advantage of our special offers on this page, and buy an art program at a discount?

We've tried to cater for most machines: the programs on offer are:

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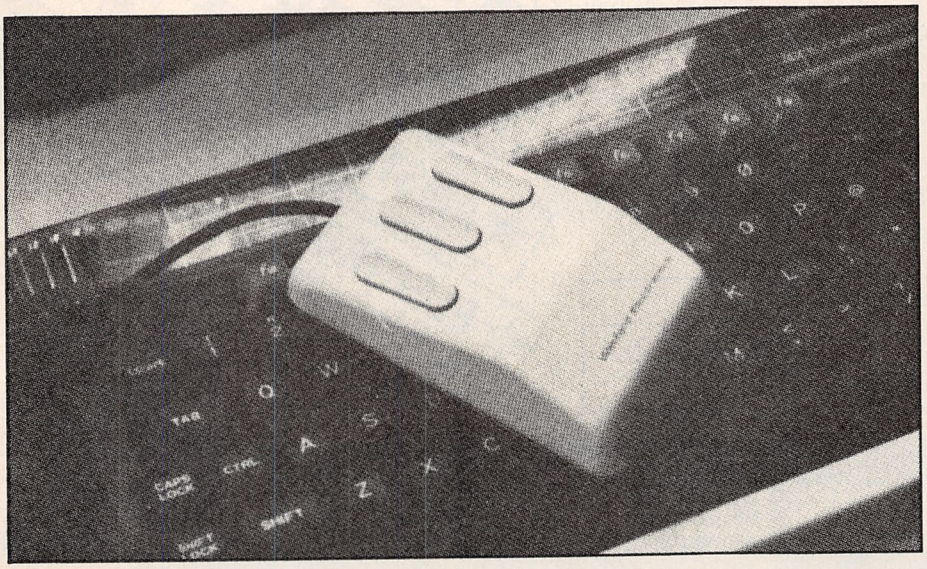
Now turn to page 20 for the final part of our series on getting the most out of graphics packages.



The Quest mouse (left)

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ON THE FACE OF IT

Paul McKinely wraps up his graphics series with a how to guide on drawing faces and other complicated forms

Up to now I've shown you how to turn the basic functions of any graphic package (line, circle, fill, ray, magnify, spray etc) into recognizable pictures and last week I talked a little about using colour and shading to give depth to your work. It is, however, quite a jump from a mountain sunset to Botticelli's 'Venus'. The human face and form are probably the most difficult subjects to portray accurately with computer graphics. This does not mean that you'll never be able to draw people on your screen, just that you'll have to put a bit of effort into it.

It will probably be best to stick to copying drawings and photographs for the time being, then when you have a bit of experience you can try creating graphics from scratch. Below I've detailed three methods of accurately copying pictures onto the screen. I'll start with the easy one.

Squares, circles and triangles

The first method involves breaking the picture to be copied into its basic components, ie squares, rectangles, circles and triangles. Fig. 1 shows a sketch of a country cottage. To start copying this onto the screen, first divide it into the simplest shapes possible. The end wall is a rectangle with a flattened triangle on top. The facing wall is a long rectangle with one end shorter than the other. The roof is the same except it slopes left. All these shapes can be drawn easily with standard functions like line, box and elastic line. Guidelines can also be drawn in to help keep the windows and doors in proportion. Background shapes can be treated in the same manner. Trees are just tall rectangles topped by circles.

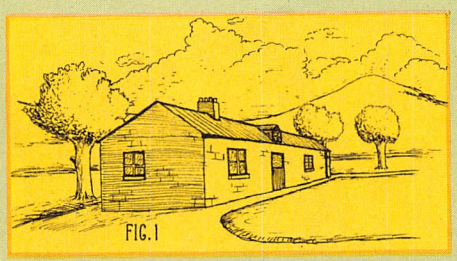


FIG.1

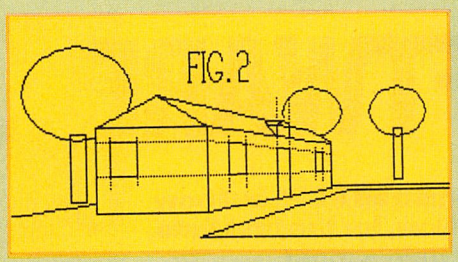


FIG.2

"The human face and form are probably the most difficult subjects to portray accurately"

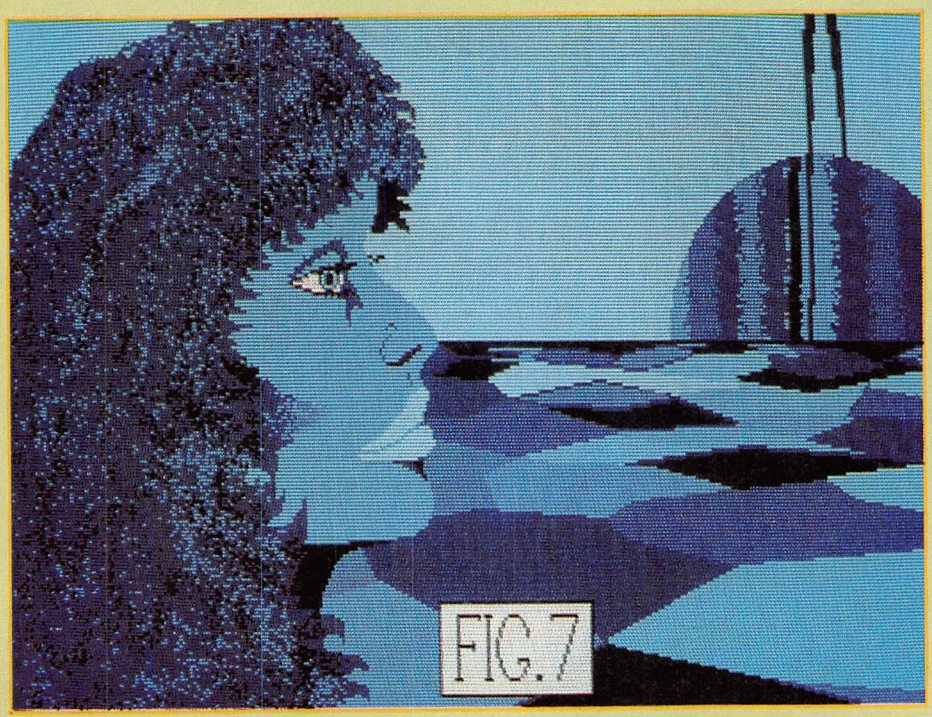


FIG.7

Once all the basic shapes are drawn in I have Fig. 2. Colour and detailing can now be added (Fig. 3). I used four colours: black, white, blue and green, along with fill patterns to produce the finished picture. The shadow on the near wall, roof and ground is a checkerboard pattern in black/white (black/green where it falls on the grass). The treetrunks are blue/black with solid black for shading while the crowns are formed by filling the circles with solid green then going around the edges with spray. Shading is added by a black spray on one side. Windows are solid blue with diagonal white bands to indicate reflections. Note that the pattern on the roof is not a fill but is drawn in by hand. This allows me to put the lines closer together towards the far end, so improving perspective. Mountains are blue/green and the sky is a blue/white checkboard.

It's obvious that this method of copying works best for angular subjects like buildings and machines. If you want to copy people or animals then other methods are needed.

Using a grid

One method, adapted from the pen and ink artworld, involves drawing equally proportioned grids over both the subject picture and your computer screen. Fig. 4 shows a drawing of a face divided into an 8×5 grid. Drawing a similar grid onto the screen will allow you to copy the picture square by square as in Fig. 5. When doing this sort of freehand drawing the draw function is not always the best choice. Depending on the program you are using and the method of input (mouse, joystick, lightpen, etc) draw mode may be too inaccurate to produce the fine lines needed. Personally I find the continuous or elastic line function best for detailed freehand drawing. Lines can be drawn two or three pixels at a time then fixed with a click of the mouse or fire button. The closer together the fixed points are the smoother the curves will be.

"One method, adopted from the pen and ink art-world, involves drawing equally proportional grids over both the subject picture and your computer screen"

"The graph method has the advantage of producing veyr accurate pictures but it has the drawback of being hard on the eyes"

The grid should be of a lighter colour than the drawing to allow you to remove it easily after the picture has been copied. In Fig. 5 the grid is blue, while the drawing is done in black. Once a grid has been drawn it can be saved before use so it may be used again. This method has the advantage that you can change the size of the picture simply by re-scaling the grid. In Fig. 5 the squares of the grid are 3 character squares by 3 character squares so the face covers almost the full height of the screen. If I wished to draw a smaller version I simply draw a smaller grid, say, 8 pixels by 8 pixels per square. This allows me to draw the face much smaller but still keep it in proportion (Fig. 5). Note how the eye level of the smaller face is in line with the eye level of the larger. This is the 'eye line'. It is similar to the concept of the horizon line I mentioned two weeks ago. Keeping the eye levels of several different sized figures on a line provides the illusion that they are in fact figures of the same size standing at various distances into the screen, as in Fig. 6.

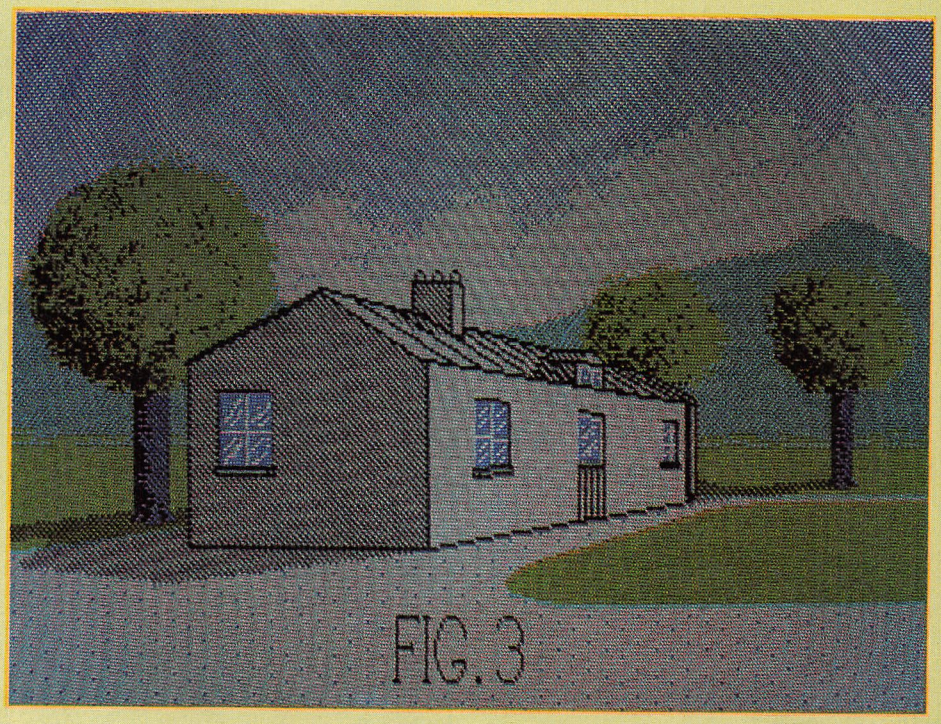


FIG. 3

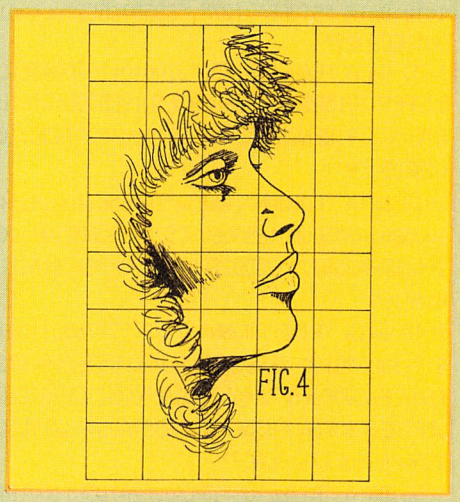


FIG. 4

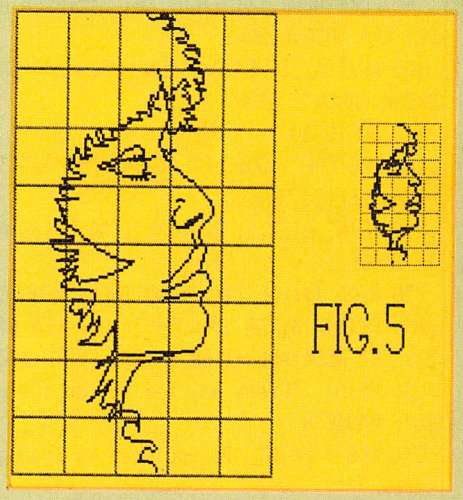


FIG. 5

You can demonstrate this for yourself by drawing a simple face on your screen. A circle with two smaller circles for eyes and a line for a mouth will do. Now draw a second face in the same way but half the size of the first. Using the move function drag the small face to different positions on the screen. You will see that only when it is on a horizontal line with the large face will it give the impression of being 'behind' it.

Graphs

Probably the simplest but most tedious way to get pictures onto the screen is to trace them out.

Place a thin sheet of graph paper over the subject you wish to copy and trace the rough outlines in light pencil including areas of highlight and shadow. Once that is done go over the graph paper again with a heavy marker filling in all the squares of the graph through which the pencil line passes. Now copy out the pattern of pixels onto the screen with magnify. Once you have the basic shape you can add any detailing and colours you wish (Fig. 7).

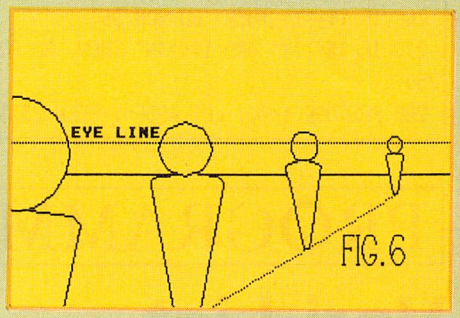


FIG. 6

This method has the advantage of producing very accurate pictures but it also has the drawbacks of the pictures being a fixed size and it's hard on the eyes.

And that's the end of this short series of articles. I hope they have been of help in showing some of the basics of good computer graphcis and that you now feel confident enough to have a go at knocking out your own version of the Mona Lisa. Happy pixel pushing!

PROGRAMMING: SPECTRUM

Screen Machine

Robert Robinson

Store and display screens in a variety of ways with Screen Machine. Screens can be faded, wiped from the left or right, top or bottom, or in columns. The attributes can be equally scrolled and also made to sweep in or out.

First, a screen must be loaded, and you are prompted for the address to load it to. The demo in the program requests a screen and then proceeds to perform its repertoire of fades. The Print routine is simply used to transfer a saved screen from memory to the screen.

To use the individual routines enter *RANDOMIZE (picture start address)* and then *LET mc=USR(specific routine start).*

```
  5 BORDER 0: PAPER 0: INK 7: CLS
 10 RESTORE 1000: INPUT "START  ";ADDR:
 CLEAR ADDR-1: LET ADDR=1+PEEK 23730+256
*PEEK 23731: LET X=2
 20 PRINT AT 0,0;"SCREEN MACHINE > R.RO
BINSON"
 30 READ T$: IF T$="***" THEN  GO TO 20
0
 40 READ CK,H$: LET C=0
 50 PRINT AT 2,0;"ASSEMBLING: ";T$,
 60 FOR A=1 TO LEN H$ STEP 2
 70 LET HI=CODE H$(A)-48: IF HI>9 THEN
 LET HI=HI-7
 80 LET LO=CODE H$(A+1)-48: IF LO>9 THE
N  LET LO=LO-7
 90 POKE ADDR,16*HI+LO: LET C=C+PEEK AD
DR: LET ADDR=ADDR+1
 100 NEXT A: IF C<>CK THEN  PRINT ''"CHE
CKSUM ERROR": STOP
 110 GO TO 30
 200 RESTORE 1000: LET ADDR=1+PEEK 23730
+256*PEEK 23731
 210 PRINT AT 2,0;"ROUTINE";TAB 20;"STAR
T  BYTES"''
 220 READ T$: IF T$<>"***" THEN  READ CK
,H$: PRINT T$;TAB 20;ADDR;"   ";(LEN H$/
2): LET ADDR=ADDR+(LEN H$/2): GO TO 220
 230 PRINT '"Press any key to run the de
mo": PAUSE 0
 240 CLS : PRINT "Do you wish to load a
screen?"
 250 POKE 23658,8: LET I$=INKEY$
 260 IF I$="Y" THEN  GO SUB 360
 270 IF I$<>"Y" AND I$<>"N" THEN  GO TO
250
 280 RESTORE 1000: LET ADDR=1+PEEK 23730
+256*PEEK 23731
 290 INK 0: CLS : INK 7: READ T$: IF T$=
"***" THEN  GO TO 280
 295 IF T$="FADE" THEN  CLS
 300 READ C,C$
 310 IF T$="STORE" THEN  GO TO 340
 320 RANDOMIZE 40000: LET MC=USR ADDR
 325 PRINT #0;AT 1,16-(LEN T$/2);T$
 330 PAUSE 200
 340 LET ADDR=ADDR+(LEN C$/2)
 350 GO TO 290
 360 INPUT "FILENAME:";F$
 370 LOAD F$CODE 40000: RETURN
1000 DATA "PRINT",975,"1100402A765C01001
BEDB0C9"
1010 DATA "STORE",1277,"ED5B765C21004001
001BEDB0C9"
1020 DATA "FADE",6175,"21004011070043E5C
57CFE583015E5CBB4D5ED5B765C19E5DDE1D1E1D
D7E00771918E6C1E1237610DE1100402A765C010
01BEDB0C9"
1030 DATA "COLUMN",4615,"2A765C1100181911
0058010003EDB0168006080C52A765CDD2100400
100187EA2DD770023DD230B78B120F3C1CB1ACBF
A10E1C9"
1040 DATA "PIXEL DOWN",7779,"2A765C11001
8191100580100 03EDB02A765C06C0C53EC090672
E007CE6C00F0F0FC640577CE6078257 7C878 7E6E
05F7DE6F80F0F0FB35FD52A765C7AD6405719D10
12000EDB0C17610CAC9"
1050 DATA "PIXEL UP",7130,"2A765C1100181
911005B010003EDB006C1C505602E007CE6C00F0
F0FC640577CE6078257 7C878 7E6E05F7DE6F80F0
F0FB35FD52A765C7AD6405719D1012000EDB0C17
610CCC9"
1060 DATA "PIXEL LEFT",6631,"2A765C11001
8191100580100 03EDB0DD2A765C111F00DD19211
F4013010120C5060BC5E5DDE506C0DD7E00A1771
9DD1910F6DDE1E1C1CB110C7610E6C12BDD2B10D
DC9"
1070 DATA "PIXEL RIGHT",6893,"2A765C1100
18191100580100 03EDB0DD2A765C2100401120000
018020C50608C5E5DDE506C0DD7E00A17719DD19
10F6DDE1E1C1CB19CBF97610E5C123DD2310DCC9
"
1080 DATA "ATTRIBUTE DOWN",2218,"2A765C1
1004001001BEDB0061BC5012000EDB0C17610F6C
9"
1090 DATA "ATTRIBUTE UP",3084,"2A765C110
04001001BEDB00100030 9E5626B09545DE10618C
5012000EDB8C17610F6C9"
1100 DATA "ATTRIBUTE LEFT",5664,"2A765C1
1004001001 8EDB0011F0009D5E5DDE1E10911200
00620C5E5DDE50618DD7E007719DD1910F7DDE1E
1C12BDD2B7610E7C9"
1110 DATA "ATTRIBUTE RIGHT",5598,"2A765C
11004001001 8EDB0D5E5DDE1E111200000620C5E5
DDE50618DD7E007719DD1910F7DDE1E1C1DD2323
7610E7C9"
1120 DATA "ATTRIBUTE INWARD",5662,"2A765
C11004001001 8EDB0060DC5E5D52A765C1180191
9DD2180591120001 9DD1910FBDDE5D1012000EDB
0D1E1012000EDB076C110D7C9"
1130 DATA "ATTRIBUTE OUTWARD",7703,"2A76
5C11004001001 8EDB0060DC5C52A765C11E01719
112000DD21E05719DD1910FB012000DDE5D1EDB0
C12A765C11001B19DD21005B11E0FF19DD1910FB
DDE5D1012000EDB076C110C3C9"
2000 DATA "***"
9990 SAVE "SCREEN": VERIFY "SCREEN"
```

PROGRAMMING: AMSTRAD CPC

Vari-List

Alastair Scott

This program for any Amstrad CPC allows you to list all the variables present in a program, in the order in which they were defined.

Once the program has been correctly entered press Control V or type in *:VARLIST* to clear the screen to Mode 1, print a title and list the variables, one at a time.

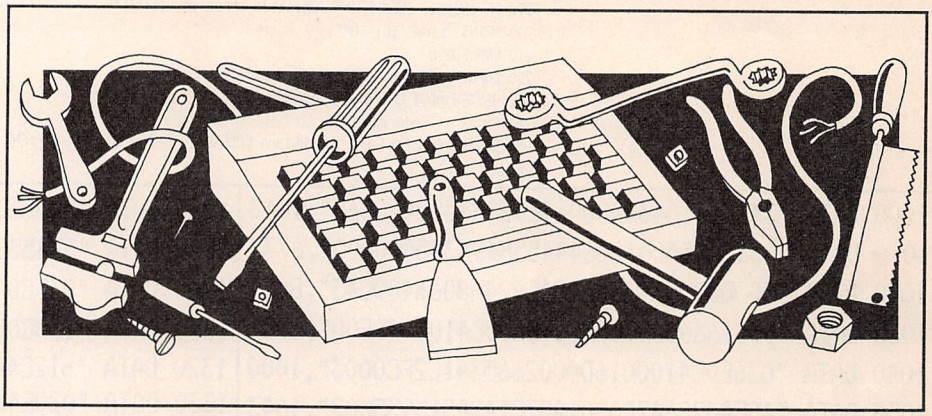
You can save the machine code with SAVE *"VARCODE",B.&9D00,&F5* and then reload it with *MEMORY &9CFF:LOAD "VARCODE":CALL &9D00.*

```
100 ' Variable List
110 ' by Alastair M. Scott
120 MODE 1:MEMORY &9CFF
130 FOR addr=&9D00 TO &9DF4
140 READ byte$:POKE addr,VAL("&"+byte$):
ch=ch+PEEK(addr)
150 NEXT
160 IF ch<>&7008 THEN SOUND 1,300,50:PRI
NT"Error in DATA statements!":END
170 SOUND 1,80,50:CALL &9D00:PEN 2
180 PRINT:PRINT"|VARLIST command install
ed."
190 PRINT:PRINT"Press CONTROL-V to list
variables."
```

```
200 KEY 141,"|VARLIST"+CHR$(13):KEY DEF
55,1,118,86,141
210 PRINT:PEN 1:END
220 DATA FD,21,F5,9D,FD,CB,00,7E,C0,FD
230 DATA CB,00,FE,01,C2,9D,21,F6,9D,CD
240 DATA D1,BC,CD,00,B9,F5,3A,02,C0,A7
250 DATA C4,AF,9D,F1,C3,0C,B9,21,CF,9D
260 DATA CD,A1,9D,2A,87,AE,E5,ED,5B,85
270 DATA AE,A7,ED,52,E1,28,32,EB,23,23
280 DATA CD,77,9D,E5,21,F2,9D,CD,A1,9D
290 DATA E1,CD,06,BB,09,E5,ED,52,E1,38
300 DATA EB,18,18,CD,77,9D,E5,E5,21,ED
310 DATA 9D,CD,A1,9D,E1,E1,CD,06,BB,23
320 DATA 5E,23,56,23,23,23,19,E5,ED,5B
330 DATA 89,AE,A7,ED,52,E1,38,DD,C9,7E
340 DATA F6,20,E6,7F,CD,5A,BB,CB,7E,23
350 DATA 28,F3,7E,FE,01,20,08,3E,25,01
360 DATA 05,00,C3,5A,BB,FE,02,20,08,3E
370 DATA 24,01,06,00,C3,5A,BB,01,08,00
380 DATA C9,F5,7E,CB,7F,20,06,CD,5A,BB
390 DATA 23,18,F5,F1,C9,21,6A,AE,22,2C
400 DATA 9D,21,68,AE,22,31,9D,21,6C,AE
410 DATA 22,6E,9D,C9,C7,9D,C3,25,9D,56
420 DATA 41,52,4C,49,53,D4,00,04,01,0F
430 DATA 02,0E,00,4C,49,53,54,20,4F,46
440 DATA 20,56,41,52,49,41,42,4C,45,53
450 DATA 0F,01,0D,0A,0D,0A,80,28,29,0D
460 DATA 0A,80,0D,0A,80,00,00,00,00,00
```


Faster Basic

Malcolm Sargent



Do you complain that your basic programs run too slow? If so you can use the following information to speed up your programs. The normal structure of a program is divided into sections, which are (1)-(2)-(3)-(4)-(5)-(6). Where,

(1) Initialisation of variables.
(2) Main loop of the program.
(3) Main body of the program.
(4) Routines.
(5) Sub-routines.
(6) Data.

However, when programming for speed it is necessary to change this structure, and this is now explained.

Basic executes a program by sequentially running each statement, where each statement follows another. This cycle is interrupted when Basic comes to an instruction where a jump to another statement is required. Then Basic starts a complicated search process. This search process might only take a fraction of a second to complete its task and carry on running the program; however, this time accumulates and slows up the program considerably. The time taken for the search process depends on the number of lines to be searched through, from the start of the program to the new line of execution. Basic has a number of instructions which cause the search process; these are *FOR . . . NEXT, GOTO, GOSUB, READ, DEF FN,* etc. If we change the structure to (5)-(4)-(2)-(3)-(6)-(1) the average number of lines in the search process will be lessened. Other variations on the structure will work better for different types of programs. Another way of lessening the number of lines in the search process is to use multistatement lines and also by removing all *REM* lines.

The variable structure is also important when speeding up programs and the variables are normally stored in a workspace at the end of the program area. This workspace is organised in order of which the variables are first defined, so those defined first are quickest to access.

In order to speed up the program we must minimise the search through the workspace and this can be done by putting the most accessed variables as near the start of the initialisation process as possible.

Arithmetic operations slow down the execution rate, especially trigonometrical and algebric operations (eg sin, cos, exp, etc). The following rules apply to most versions of Basic, and should be used to speed up arithmetic operations.

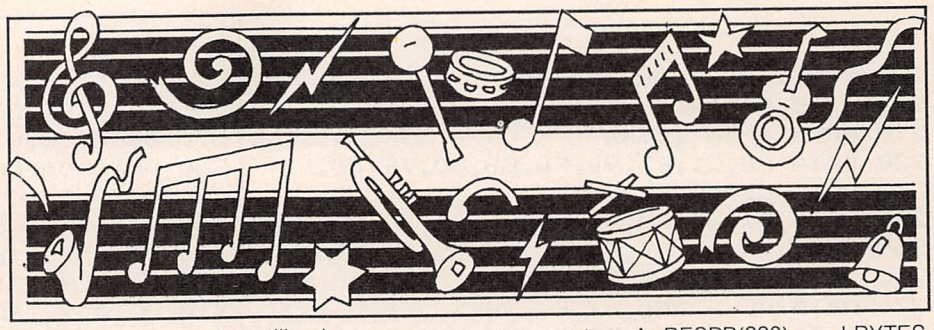
1. Addition is roughly five times faster than multiplication so *LET A=Y+Y* is faster than *LET A=Y*2.*
2. Multiplication is about 1.5 times as fast as division so the statement *LET A=Y*0.001* is faster than *LET A=Y/1000.*
3. Multiplication is about 4.5 times as fast as exponential powers so *LET A=X*X* is faster than *LET A=X↑2.*
4. An expression containing a repeated operation should be broken up so that the operation is evaluated only once, eg *LET A=X*Y+3(X*Y)+(X*Y)/4.* This can now be broken up into the statements *LET B=X*Y* and *LET A=B+3*B+B/4.*
5. Many programmers use brackets when the expression can be written without using them. By using unnecessary brackets the expression will be slowed down by about half.
6. Many trigonometrical expressions can be worked out on a calculator, or partly worked out, thus speeding up the operation. A simple example would be *LET A=sin 90* for which *LET A=1* is the same but about 150 times faster.
7. Remove all constant expressions from within loops. The statements *FOR I=1 TO 10 : LET A(I)=X(I) + SQR (T)+R : NEXT I* could be replaced with the following faster code, *LET S=SQR (T)+R : FOR I=1 TO 10 : LET A(I)=X(I)+S : NEXT I* (*R* and *T* are variables all ready defined).

As a final measure to speed up your program you could trace all innermost loops (complete instructions which are executed the most often) and remove all redundant operations and instructions.

The times taken by the computer to find a program line, or variable, or work out a mathematical expression is small by human standards and normally the effect is minor, but when you have a loop which might be executed thousands of times during the program's execution, the time difference can be up to 30% faster.

Cat

David Stewart



The standard DIR command may list what is on a microdrive but it does it in an unattractive manner, and it doesn't reveal the lengths of the files. This program will remedy all of that.

The new command can be used as CAT, CAT drive or CAT drive, channel so that other mediums besides the defaults of drive one and screen can be utilised.

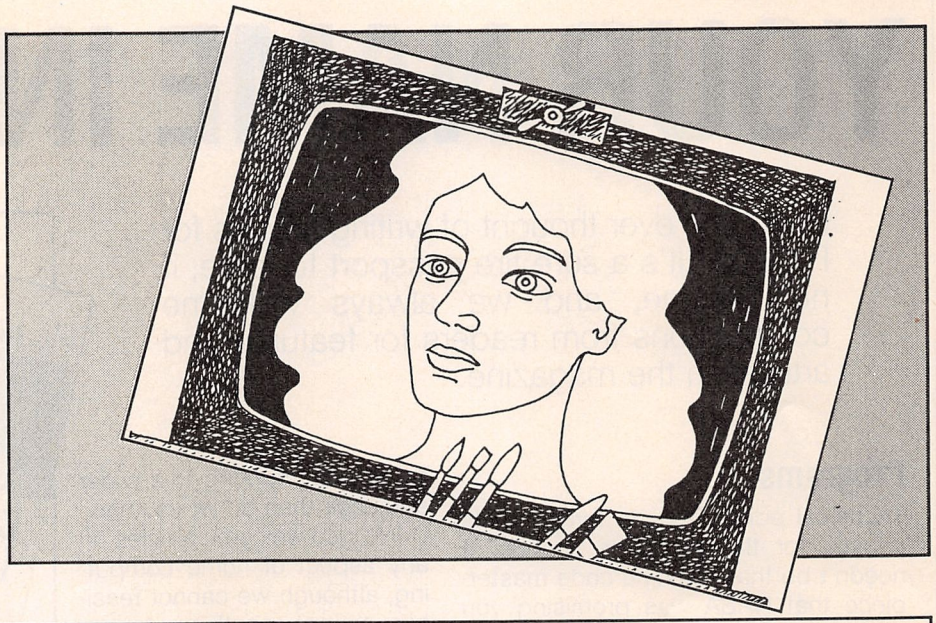
To load the code produced by the program enter A=RESPR(880) : LBYTES MDV1_CAT_BIN,A:CALL A.

```
100 REMark (c) DAVID STEWART
101 REMark  8th July, 1987
110 REMark
120 start=RESPR(880):Address=start
130 FOR L=1000 TO 1540 STEP 10
140 RESTORE L:sum=0:READ a$,cs
150 FOR r=1 TO LEN(a$)-1 STEP 2
160 byte=16*DEC(a$(r))+DEC(a$(r+1)):sum=sum+byte
170 POKE Address,byte:Address=Address+1
180 END FOR r
190 IF cs<>sum THEN PRINT 'Checksum error in ';L:STOP
200 PRINT 'Line ';L;' OK'
210 END FOR L
220 INPUT \\'Press ENTER to save code on MDV1_';a$
230 SBYTES MDV1_CAT_BIN,start,880
240 PRINT \\'Code saved ok.'
250 DEFine FuNction DEC(H$):RETurn CODE(H$)-48-7*(CODE(H$)>57):END DEFine
260 :
```

```
1000 DATA "347B011043FA00064E924E750002006E",1043
1010 DATA "0343415400100644455649434500000",673
1020 DATA "0000000034780112 4E924AB066400C43",862
1030 DATA "00016600027E32369B000C4100046E00",678
1040 DATA "026E0C4100016D0002665341C2FC0003",1000
1050 DATA "45FA02B647FA001AD7C142451593 5002",1643
1060 DATA "159B501B52450C45000366F042B04E75",1246
1070 DATA "4D4456464C5046444B52414D610001DC",1212
1080 DATA "660001067001 72FF760441FA027C4E42",1298
1090 DATA "4AB0660000F42A4843FA02766100015E",1291
1100 DATA "4AB0660000DA4246744076FF43FA020C",1542
1110 DATA "204D70034E434A40670C0CB0FFFFFFF6",1773
1120 DATA "6740600000BA43FA01F24A9167DE0491",1702
1130 DATA "0000004052466100 00B243FA021E6100",937
1140 DATA "011C43FA02626100011443FA01CED3FC",1551
1150 DATA "0000000E6100010643FA027061000 0FE",900
1160 DATA "60AA43FA026661000 0F432066100010B",1190
1170 DATA "43FA021661000 0E643FA023861000 0DE",1362
1180 DATA "204D43FA019632FC000A70454E4345FA",1534
1190 DATA "0186248143FA01847402 0C31000A2000",971
1200 DATA "660613BC00BF20005242 0C42000D66EA",1113
1210 DATA "43FA016861000 0A643FA01DC6100009E",1478
1220 DATA "321A610000B243FA01FA61000 0903212",1228
1230 DATA "610000A443FA01F461000 08242802800",1284
1240 DATA "204D70024E4220044E754BE77C2043FA",1374
1250 DATA "012A2211243C000186A043FA015E4251",1044
1260 DATA "424342447A0292B24AB16D0452436 0F6",1474
1270 DATA "D2B24A446610 4A43660C525113BC0020",1257
1280 DATA "500052456010060300305251138 35000",793
1290 DATA "5245383C00010C820000000 1670E4243",661
1300 DATA "84FC000A02B20000FFFF60BA4A446606",1568
1310 DATA "13BC003050FF4CDF043E4E754BE77040",1629
1320 DATA "612C4AB06608341976FF70074E434CDF",1466
1330 DATA "020E4AB04E7548E7707061124A806606",1365
1340 DATA "347800CE4E924CDF0E0E4AB04E754BE7",1629
1350 DATA "402045FA00D242813212C2FC0028D2AE",1758
1360 DATA "0030B2AE0034620E2076180042804CDF",1231
1370 DATA "04024AB04E7570FA60F44243BBCB670A",1741
1380 DATA "34780112 4E924AB0664245FA009B321A",1332
1390 DATA "34124A4367140C4300026E3632369800",835
1400 DATA "0C43000167043436980 24A416F200C41",806
1410 DATA "00066E1A3541FFFE060100301541 0007",917
1420 DATA "1541001D348242B061B44AB04E7570FC",1481
1430 DATA "4E7570F14E750000000000000000000",743
1440 DATA "0000000000000000000000000000000",0
1450 DATA "0000000000000000000000000000000",0
1460 DATA "0000000000000000000000000000000",0
1470 DATA "0000000000000000000000000000000",0
1480 DATA "0000000000010001000 54D4456315F00",382
1490 DATA "00150A44697265637 46F7279206F6620",1257
1500 DATA "4D44566E5F0A0A00000C2066696C6573",1031
1510 DATA "20666F756E64000E0A536563746F7273",1335
1520 DATA "206C6566742000092062797465732 02D",1160
1530 DATA "2000000D0A4D65646975 6D206E616D65",1113
1540 DATA "200000062066726F6D2000010A",549
```

Production

D J Cook



If you want to produce nicely laid out screens of graphics or text in C64 Basic then this is the easy way to do it. Run the program and install it with *SYS 49486*. Then, simply draw on the screen the layout that you want, using the cursor keys. Don't press Return. Also, don't use " " (quotes).

When you are satisfied press *F1* and the screen will be transformed into *PRINT* statements that are added to your Basic program from lines 50000 onwards.

Once used, the routine switches itself off so must be reinitialised. For a second screen the line numbers start at 50260 to avoid overlapping.

```
 20 J=49152
 30 READA: IFA=-1 THEN 100
 40 POKEJ,A
 50 C=C+A: C2=C2+A*(J-49151): J=J+1
 60 GOTO30
100 IF C<>41768 OR C2<>7150236 THEN PRINT"CHECKSUM ERROR"
120 END
200DATA 144,5,28,159,156,30,31,158,129,149
210DATA 150,151,152,153,154,155,80,195,10,169
220DATA 4,197,197,208,3,32,242,192,76,49
230DATA 234,169,15,49,253,197,155,240,20,197
240DATA 156,240,16,133,155,168,185,0,192,160
250DATA 0,145,45,230,45,208,2,230,46,96
260DATA 133,163,169,224,37,163,208,5,169,64
270DATA 5,163,96,169,192,37,163,208,3,165
280DATA 163,96,169,32,37,163,208,5,169,32
290DATA 5,163,96,169,192,69,163,96,160,0
300DATA 169,128,49,251,197,199,240,245,133,199
310DATA 73,146,76,49,192,160,0,173,16,192
320DATA 32,49,192,173,17,192,32,49,192,24
330DATA 173,18,192,109,16,192,141,16,192,169
340DATA 0,109,17,192,141,17,192,96,169,153
350DATA 32,49,192,169,34,76,49,192,141,16
360DATA 192,169,0,109,17,192,141,17,192,96
370DATA 162,40,32,31,192,32,98,192,169,127
380DATA 49,251,32,60,192,32,49,192,230,251
390DATA 208,2,230,252,230,253,208,2,230,254
400DATA 202,208,225,169,34,32,49,192,169,59
410DATA 32,49,192,169,0,32,49,192,165,45
420DATA 145,47,200,165,46,145,47,136,165,45
430DATA 133,47,165,46,133,48,32,53,192,76
440DATA 53,192,173,33,208,41,15,133,156,133
450DATA 155,169,0,133,253,133,251,169,4,133
460DATA 252,169,216,133,254,56,165,45,233,2
470DATA 133,47,165,46,233,0,133,48,32,115
480DATA 192,169,143,32,49,192,32,213,192,169
490DATA 24,133,2,32,115,192,32,148,192,32
500DATA 170,192,198,2,208,243,32,115,192,32
510DATA 148,192,162,39,32,172,192,169,0,145
520DATA 47,200,145,47,120,169,49,141,20,3
530DATA 169,234,208,8,120,169,19,141,20,3
540DATA 169,192,141,21,3,88,96,-1
```

YOUR NAME IN LIGHTS

Have you ever thought of writing articles for Popular? It's a sure fire passport to fame, if not fortune, and we always welcome contributions from readers for features and articles in the magazine.

Programs

Technical editor Duncan Evans relies on you for the programs section. It needn't be that machine code masterpiece that NASA was promising you vast sums for, what we're looking out for is handy routines, utilities, anything that you've concocted that makes your life easier as a programmer that you'd like to pass on to others.

Don't make your programs too long, please – it's best if we can print the full listing in one week, and a four part listing is probably the largest we can accept. If they're very short, then so much the better, they'll fit neatly into our Bytes and Pieces page.

Features

We're also particularly interested in articles about programming, which should be sent to Christina Erskine. If you think you could explain technical areas of computing to a wider audience then do let us know.

We also welcome articles on any aspect of home computing, although we cannot feasibly accept anything longer than 2000 words. It's worth checking by phone or letter first that your piece will be suitable, but we're open to all ideas.

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Mark Jenkins welcomes correspondence of a musical nature for Soundcheck, Martin Bryant is interested in any queries or views regarding computer chess, and our communications correspondents will be happy to answer questions about modems and networks (mark your envelope 'Comms').

Any technical or programming problems you're encountering can be addressed to Kenn Garroch. Kenn tries to help as many people as possible in Peek and Poke, but cannot undertake to give personal replies.

How to submit

For features, it is almost always better if you write or telephone first to discuss your ideas with us. Your articles should be typed or word processed, preferably in double spacing, using one side of the paper only.

Please don't write more than 2000 words for an article. Program notes should explain what your program achieves and how it works, but, again, please keep them concise.

Payment

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Your payment should arrive six weeks after publication date.

Where to send them

All submissions should be sent to *Popular Computing Weekly*, 12–13 Little Newport Street, London WC2H 7PP. If you mark which department your letter is destined for on the envelope it will help us process them much more quickly.

We will make every attempt to acknowledge receipt of your submission.

Mini Editor

Ralph Lorenz

This QL listing is a file editor. A normal file can be loaded up, examined and altered, byte by byte. A line of the data is displayed and can be scrolled through using the left and right cursor keys.

If you wish to change the highlighted character press *'a'* and enter the character you wish to substitute. Press *'s'* to save the altered file.

```
5 MODE 8 : PAPER 0 : CLS
7 s$=""
10 INPUT"Filename ( incl. dev )?"\,f$
20 OPEN_IN #4,f$
21 REPeat loop
22 s$=s$&INKEY$(#4)
23 IF EOF(#4) THEN EXIT loop
24 END REPeat loop
35 CLOSE #4
40 l=LEN(s$)
50 p=1
70 AT 2,0 : PAPER 1
80 e=p+32
85 IF e>l THEN e=l
90 PAPER 0 : AT 2,0 : PRINT FILL$(" ",33)
100 AT 2,0 : PAPER 1 : PRINT s$(p TO e)
110 AT 2,0 : PAPER 2 : PRINT s$(p)
115 z$=INKEY$(0)
120 IF z$=CHR$(192) AND p>1 THEN p=p-1
130 IF z$=CHR$(200) AND p<l THEN p=p+1
140 IF z$="s" THEN GO TO 2000
150 IF z$="a" THEN GO TO 1000
200 GO TO 70
1000 BEEP 2000,20
1010 INPUT "Character ? ";c$
1020 s$(p)=c$
1025 PAPER 0 : AT 3,0 : PRINT "
1030 GO TO 160
2000 DELETE f$
2010 OPEN_NEW #4,f$
2020 PRINT #4,s$
2030 CLOSE #4
2040 STOP
```

User Directories

A Down

With this Amstrad CPC program you can install an RSX which enables you to access 256 user directories instead of the usual 16.

The syntax is *:USE,N* where *N* is the number of the directory.

Follow on-screen directions after typing it in.

```
10 MEMORY &8FFF
20 m=&9000
30 READ a$:IF a$="END" THEN PRINT
"TYPE CALL &9000":END
40 POKE m,VAL("&"+a$)
50 m=m+1
60 GOTO 30
70 DATA 01,0D,90,21,09,90,C3,D1
80 DATA BC,FC,A6,0D,90,12,90,C3
90 DATA 16,90,55,53,C5,00,DD,7E
100 DATA 00,32,01,A7,FE,E5,20,0C
110 DATA 21,2D,90,7E,CD,5A,BB,23
120 DATA FE,00,20,F7,C9,07,45,6E
130 DATA 74,65,72,69,6E,67,20,45
140 DATA 52,41,53,45,44,20,46,49
150 DATA 4C,45,20,55,53,45,52,0D
160 DATA 0A,53,61,76,65,20,6E,6F
170 DATA 20,66,69,6C,65,73,20,68
180 DATA 65,72,65,0D,0A,END
```

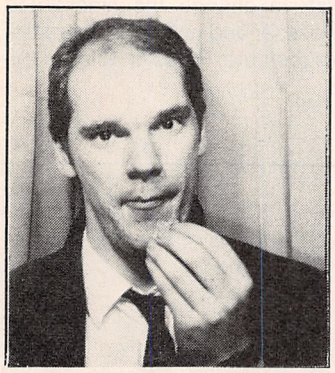
String$

Adam Wright

This C64 routine will give you a *STRING$* style command as used on the BBC. The syntax is *SYS 49152, (string character, number of), string variable*, where the variable will contain the result of the operation.

```
0 REM STRING$
1 DATA 32,253,174,32,250,174,32,158
2 DATA 173,32,166,182,201,1,240,3
3 DATA 76,72,178,160,0,177,34,133
4 DATA 250,32,253,174,32,138,173,32
5 DATA 247,183,165,21,240,3,76,72
6 DATA 178,165,20,133,251,32,247,174
7 DATA 32,253,174,32,139,176,166,13
8 DATA 208,3,76,72,178,165,69,141
9 DATA 0,2,165,70,141,1,2,169
10 DATA 36,141,2,2,169,61,141,3
11 DATA 2,169,34,141,4,2,165,250
12 DATA 160,0,153,5,2,200,196,251
13 DATA 208,248,169,34,153,5,2,200
14 DATA 169,0,153,5,2,165,122,72
15 DATA 165,123,72,169,0,133,122,169
16 DATA 2,133,123,32,121,165,32,115
17 DATA 0,32,237,167,104,133,123,104
18 DATA 133,122,96
20 S=49152:CK=0:FOR A=S TO S+138
30 READ D:POKE A,D:CK=CK+D:NEXT A
40 IF CK<>15594 THEN PRINT "ERROR":STOP
50 SYS S,("*",40),A$:PRINT A$

READY.
```



with Kenn Garroch

Sharper Sords

Steven Folkes, of Lightwater, Surrey, writes:

Q I have owned a Sord M5 computer for several years now and have been very pleased with it. I also purchased a Sord PT5 thermal printer.

Recently, however, the print head has worn out. I wrote to CGL but the letter was returned, saying that the address didn't exist. I would be grateful if you or one of your readers could tell me where I could obtain a new print head, or a more up to date address for CGL.

Also, as there is very little information about the Sord, I have decided to find out about it for myself, and have started doing a Rom disassembly.

I would also like to be able to program the peripheral chips directly. I would be grateful for any information concerning the following chips: Texas Instruments TMS 9918A VDP; TI SN 76489 PSG; Z80A CTC chip.

A Sorry I can't be of much help with the address or the printer, perhaps one of our readers can help?

The chips are a little easier although I don't know the precise information concerning their use in the Sord. However, the TMS 9918A is the same video chip used in MSX machines, among others. If you can find out the i/o port numbers of the VDP, ie, the number used for the Z80 in and out operations, then the following may be useful.

The 9918A used two ports, one for addressing the video Ram and registers, and the other for data transfer. These are generally placed one above the other, ie, X is the 8-bit address register, and X-1 is the data register. The 9918 normally has its video Ram separate from the main Ram so all communication has to go through the VDP using the Z80 commands in and out.

To write to the VDP registers, first of all read port X to bring the VDP to attention and then send the value to be written to X followed by the register number plus 128. To write to the VRam (Video Ram) itself, read X and then send the address in low, high byte format to X followed by the value to be written to X-1. Reading the VRam is the same except that X-1 is read with in. As far as I know, the VDP registers cannot be read so a copy of their contents needs to be kept somewhere in Ram.

The VDP registers are:

Register	Contents
0	Bit 0=1 enable external VDP 0 disable Bit 1 is M3, used for selecting the screen mode The rest are unused.
1	Bit 0, sprite magnification Bit 1, sprite size selection Bit 2, reserved Bit 3, M2 of screen mode select Bit 4, M1 of screen mode select used with M2 & M3 as M1 M2 M3 0 0 0 Text mode 1 0 0 1 High res graphics mode 2 0 1 0 Multi-colour graphics mode 3 1 0 0 Text mode 0 Bit 5, Interrupt enable Bit 6, Screen on off switch Bit 7, Select VRam size 4K or 16K.
2	Bits 0–3 are name table address/1024.
3	Bits 0–7 are colour table address/64.
4	Bits 0–2 are address of pattern, text, or multi colour generator table depending on the screen mode. Address/2048.
5	Bits 0–6 are address of sprite attribute table/128.
6	Bits 0–2 are address of sprite pattern table/2048.
7	Bits 0–3 are background colour and 4–7 foreground colour.
8	Read only status register Bits 0–4 are the fifth sprite number Bit 5 Sprite collision flag Bit 6 Fifth sprite flag Bit 7 Interrupt flag.

Playing around with these should give you a good idea of what they do. The main things to note are that only four sprites are allowed on screen at once, and some of the tables only refer to particular screen modes.

There are 31 sprite definitions, and the format of the sprite attribute table is:

Byte 0 Y position
Byte 1 X position
Byte 2 Pattern number in the pattern table
Byte 3 Bits 0–3 are the colour

The first four bytes in the table refer to sprite 0 which is the front sprite, the second four to sprite 1, etc, Poke around in the Sord's VRam to see if the above are correct and if so, more details can be found in one of the many MSX handbooks.

Both the 76489 PSG and the Z80 CTC are sold by Maplin Electronics so you should be able to obtain data sheets from them. Access should be similar to the VDP using ins and outs.

I hope that this is of some help and that my assumptions concerning the similarity of the MSX are reasonable (no doubt, if they're not, someone will say so).

Tandy advice

D M Burns, of Bradford, W Yorks, writes:

Q Re your queries on the Tandy printers, *Popular*, July 10: as it happens, I have both the printers mentioned and the following information may be useful.

Easiest one first: CGP 115: Only requires three connections as you rightly said, ie, GND, TX, and CTS. The connections are as follows (see diagram) looking at the pin end of the lead.

It is also possible that you may have to connect a loop line between CTS and DTR (ie, short it out) on the RS232 (for both printers).

DMP 105: Output from transmitted end row – data (binary) preamble codes to set up the graphics as follows:

Line feed CHR$(27);CHR$(90);CHR$(n) where n is a fraction n/72 inches. Without any preamble (no escape codes), the line feed is 7/72". Try n=5 for graphics. Everytime a CHR$(10) or CHR$(138) is detected, a line feed is generated.

Graphics mode set by CHR$(18) and unset by CHR$(30).

Elongation set by CHR$(27);CHR$(14) and unset by CHR$(27);CHR$(15).

Any other codes are ignored ie CHR$(27)+ anything besides those discussed.

Dot positioning set by CHR$(27);CHR$(16),N1,N2 +CHR$(x) where CHR(x) is any combination of the seven pins, N1 from 0 to 3 and N2 0 to 255 except when N1=3 where N2 is 0 to 31.

If character style is normal, then the number of dot columns available is 480, if compressed, then 576 and if condensed, is 800. Therefore, to access the 479 columns in normal mode, use N1=1;N2=223. I hope that this goes some way to helping everybody who has these printers. All of the code work with my Spectrum Plus and there is not much trouble with the QL either.

1 Not connected
2 CTS (Status)
3 Ground
4 TX (Data)

CGP 115 connection

One thing to note is the buffer store on the DMP-105 which is 138 bytes. If transmission stops for more than a second or so then it gives an automatic line feed (CR+LF). If the mode is not changed and transmission starts again then it will print the first recognisable character it detects. It also has a dual baud rate of 2400/600 that can be set with the DIP switches.

A Thanks for the tip.

Amstrad Fatality

Rev Thomas Scarborough, of Port Elizabeth, South Africa, writes:

Q I get that sinking feeling whenever a "FATAL" error message appears on my Amstrad PC1512 screen. The most

frequent of these – FATAL: Internal Stack Failure, System Halted – is not documented. What does it mean?

Also, the manual stresses that the discs should be removed before resetting or switching off the computer, and that they should not be inserted before powering up. If the disc drives are not in operation, why is this necessary?

A A stack failure is generally caused by a program trying to put too much onto the stack causing it to overflow (or try to) and crash into the rest of the operating system.

A stack works in the Last In First out (LIFO) format and is used to store return addresses for subroutines, argument passing, and temporary storage, etc. The LIFO arrangement means that to start with, the stack pointer holds the address of the stop of the stack.

When something is pushed onto it, the pointer moves down to point at the next free space. Taking something off it moves the pointer up and removes that item again, leaving the SP pointing at the next free space.

The upshoot of this is that if you put too much on to the stack, it runs out of memory space and tries to store things in the area under the stack. If the machine senses that this is trying to be done, it gives an error, though it shouldn't necessarily be fatal. The cause of the problem depends on what you are trying to do with the machine. If you are programming it in Basic, then you have probably got a recursive subroutine, ie, one that calls itself and keeps on doing it until the stack is full, eg,

```
100 GOSUB 100
```

Alternatively, you may just have a lot of nested subroutines giving the same effect although, this is unlikely. Some Basics allow the rather bad habit of jumping out of FOR. NEXT loops which can cause the same problem since the data for the loop is kept on the stack, and never taken off. However, in Basic, fatal errors should not occur.

If it is a machine code program that is giving this problem then you need to increase the amount of space set aside for the stack, and/or examine your program carefully to see why so much stuff is being placed onto it in the first place.

Commercial software should never give stack problems unless used in a strange way, ie, with other, memory resident, programs or without enough memory. If it is commercial software that is playing up then you will have to take it up with the supplier or software house.

On the question of the disc drives, when the machine is switched on and off, it is possible that spurious pulses can be sent to the drive controller that can cause it to do strange things and possibly damage a disc. The other possibility is that the power supply is positioned next to the drives, and the surge through the transformer causes a magnetic field that may damage your discs.

In practice, most modern disc drives have none of these problems, or shouldn't have, since they are, in general, made to be used in the worst way possible, ie, leave the discs in all the time (I certainly do, and so far, have had no problems). However, if the manufacturer advises that you take the discs out, then do so.

In the early days of computers, there was a machine called the Commodore PET which had disc drives that gave this problem. Sometimes they would completely wipe the disc when the power was switched on or off. In later models, this problem was cured, and the drives gave no more trouble – the disc could be left in with no ill effects. The main thing is to make regular backups, anticipating the fact that one day, the computer, for one reason or another, will eat a disc, plastic and all.

Atari experiments

Alan Henderson, of Wokingham, Berks, writes:

Q I recently bought an Atari ST and have been experimenting with machine code. I have been able to write quite a few programs, but one thing has stumped me. I would like to be able to execute a sequence of programs whenever the ST is switched on, set up the RAM disc, clock, etc. I know about the AUTO folder and COMMAND.PRG but I cannot get a sequence of programs to run. Could you tell me how this is done?

A All you need is a program in the AUTO folder that uses the Gem EXEC function to load and run the programs in sequence. EXEC is Gemdos (Trap #1) $4B and requires the following parameters:

Environment	Long word of the address of the env string. I'm not sure what this is for, but it works of it points to zero, ie, a null string.
Command	Long word address of the command string, identical to the command input for TTP (TOS Takes Parameters). If none then point to zero.
File	Address of the file name string to be executed ie the pathname.
Start/load	0 means load and run, 3 means load but don't execute, the address of the base page is returned in DO in this case.

When a program has been loaded and run, exiting returns you to the calling program which can then load and run another. One thing to note is the type of the command program. This should be of the type PRG, otherwise, any PRG files that are loaded and run have a tendency to crash since the mouse and menus do not work properly.

It is possible to run Tos programs from PRGs but not the other way around. In the auto case it does not matter since the system is looking for a PRG file in the AUTO folder (there should only be one file in there).

As an example, the following program loads a Ram disc and a date time setup program before exiting to the desktop. Assemble it into a file called CMD.PRG (or whatever .PRG) and then copy it into the AUTO folder.

The discname should be DESKTOP and the two files RDISK and DTIM should be available in the top level directory, ie A:RDISK.TOS and A:DTIM.TOS. If you want them in a folder then put the correct pathname in the file names of the CMD file. Save the desktop and reboot, the programs will run automatically.

```
START   MOVE.L  A7,A5          Standard header
        MOVE.L  #USTK,A7
        MOVE.L  4(A5),A5
        MOVE.L  $C(A5),D0
        ADD.L   $14(A5),D0
        ADD.L   $14(A5),D0
        ADD.L   #$100,D0
        MOVE.L  D0,-(SP)
        MOVE.L  A5,-(SP)
        MOVE.W  D0,-(SP)
        MOVE.W  #$4A,-(SP)
        TRAP    #1
        ADD.L   #12,SP
        BSR     GO
        MOVE.L  #0,-(SP)
        TRAP    #1

GO      move.l  #env,-(sp)      Environment string (null)
        move.l  #com,-(sp)      Command string (null)
        move.l  #fil1,-(sp)     First file
        move    #0,-(sp)        Load and run please
        move    #$4B,-(sp)      GEMDOS EXEC
        trap    #1              Doit
        add.l   #16,sp          Correct the stack
        move.l  #env,-(sp)
        move.l  #com,-(sp)
        move.l  #fil2,-(sp)     Second file
        move    #0,-(sp)
        move    #$4B,-(sp)
        trap    #1              Doit
        add.l   #16,sp
        rts
env     dc.b    0               Null env string
com     dc.b    0               Null command string
fil1    dc.b    'RDISK.TOS',0   RAM disk program
fil2    dc.b    'DTIM.TOS',0    Date time program

        DS.L    256
USTK    DS.L    1               User stack of 256 longs
        EVEN

        END
```

Atari rumours

Stuart Birchall, of Upholland, Lancs, writes:

Q I was considering buying an Atari STFM as a progression from my C64. However, as I am not purchasing a monitor, rumours of the Atari modulator being ineffective and substandard, causing severe screen distortion, have deterred me.

Are these rumours true, or has Atari ironed out its modulator problems?

A As far as I know, there are no problems with the Atari RF modulator. The only picture distortion will be due to the medium resolution being a little too fine for the TV picture. Low res should work fine.

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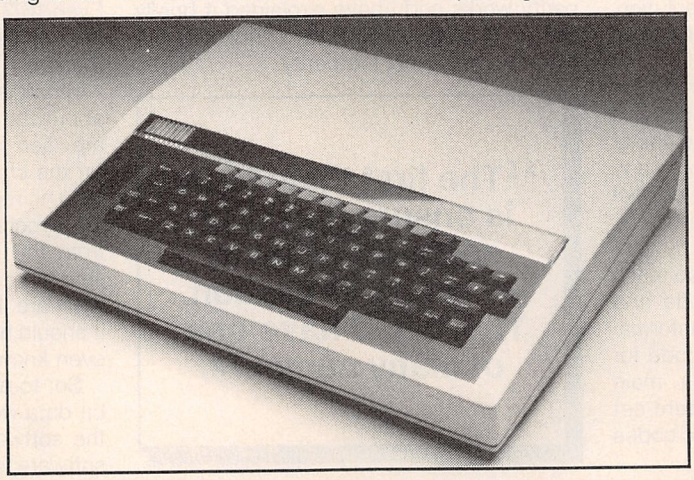
Mark Jenkins finishes his review of the UMI3S, and lets you in on a real bargain.

As promised last week, we'll start by completing our look at the UMI3S, the stripped-down version of the UM12B Midi interface and software for the BBC and Master Series.

As I pointed out, the 3S has fewer connections than the 2B (Midi In, two Midi Outs, Clock, Sync 24 and Start/Stop) plus connections to the 1MHz bus and user port. Whether you're using it with one or many synths, and with or without a drum machine, it's simplicity itself to connect up once you've installed its Eprom firmware.

You can use 16-channel recording and each channel can be in real time or step time, the latter cleverly displaying each note and octave as you play it. You can overdub a pattern many times, although of course this will be of limited use if you only have one synth capable of operating on one Midi channel and making only one sound at a time.



Edit Pattern allows you to remove memory-consuming pitch bend, modulation or patch change information from your performances, and you can use Append Pattern to add patterns together or to make "safety copies" of patterns in different memory locations. Patterns are simply identified by number, 1–127, and when you want to create a song you simply type in a series of pattern numbers and choose Song Play.

In Song Play mode you can use the comma and dash keys to add transpositions to your patterns – so "4, 4–3, 1, 4,2" could play a chorus, then the same chorus three semitones lower, then a verse, then the chorus again, this time two semitones higher than normal. You can even display different portions of the song in different colours, and insert symbols which will repeat or loop sections.

You can re-assign all the Midi channels used by the 16 tracks and the Midi synch implementation is quite advanced. It's also very easy to link up to a non-Midi drum machine provided it has either a Roland Din sync or a clock input, and both patterns and songs can be saved to tape or disc.

As a bonus, the 3S is also able to save DX7 sounds and Casio CZ sounds singly or in banks, and will utilise shadow Ram where available for increased song capacity. The 3S can be synchronised to tape for complex multi-track recordings, which is obviously useful when you don't have as many synths as you want tracks.

The 3S has been designed more for the computer buff interested in music than for the musician interested in using computers. However, it's quite a powerful system; the most important point is that it's friendly and rapid in use. The Beeb's display looks terribly simple compared to the packed screens of the latest ST and PC packages, but at least everything is labelled in plain English and there's little chance of confusion; the space bar and return key do 90% of the work.

The 3S system works quickly and efficiently, and will be updated gradually to give it more of the editing and other facilities of the UM12B. In the meantime, it remains an excellent Midi workhorse for current BBC owners, although perhaps not sufficient argument for buying a BBC in the first place if you're still trying to choose a music micro. Price is £230 including postage.

For a more powerful system you could go for the UMI Professional, which has four output ports to minimise delays and which has on-board software for "micro editing" (editing of every Midi event) and for sound editing of the DX7 and TX81Z module. Port two on the Professional model can also have a D-A convertor added to control a monophonic analog synth such as Mini-Moog. Price is £287.50.

Now on to some real budget stuff. Grant Punchard has kindly written from Aldershot after entering his local Curry's to buy a tumble dryer and coming out with an Echosoft synth keyboard for the Spectrum 128 for £10. Normally this unit is sold with the micro at £130, but after dashing home to plug it into his existing Spectrum, Grant says he was "stunned by its sophistication and sound quality. The 3-octave metal keyboard has full-sized keys, very user-friendly software with record and play back options, a superb edit mode for amplitude and pitch envelopes and a capacity of eight sounds in memory".

Grant's not sure if the Echosoft is available at this price nationwide, but it may be worth nipping down to your local Curry's to find out.

Richard Shaw of Glasgow writes, "I own a Casio CZ5000 and a Spectrum – I've read about the Ram Music Machine, *CZ Android* and *CZ Tool Kit* – but have not been able to find them locally".

The Ram Music Machine should be available nationally – as you'll know by now, it provides a little bit of Midi sequencing, a little bit of sampling and a little bit of sampled percussion at around £50. If you can't find it in any micro shops (or even Boots) try calling Ram at 106 Fleet Road, Fleet, Hampshire (0252 850085).

CZ-Android is manufactured by Hybrid Arts and distributed by Syndromic Music but is only available on the Atari ST. The *CZ Tool Kit*, on the other hand, is a very powerful editor/librarian system available from XRI Systems at 10 Sunnybank Road, Wylde Green, Sutton Coldfield, West Midlands (021-382 6048) and they'll be happy to send you a price list for mail ordering.

New products coming up for review in the next few weeks – *EDTX81Z*, a TX81Z editor for the ST from Softwares; and a load of sequencers, event editors, librarians and other packages for the FB01, Mirage, RX drum machine, DX/TX7, Prophet 2000 and Casio on the C64/128, PC and ST from Sonus, newly imported into the UK. Plus next week – the winners of our first birthday competition.

U-Music, 17 Parkfields, London SW15 6NH, 01-788 3729.

A QUESTION OF PARITY

David Wallin answers readers' questions about the logistics of bulletin boards and the reasons why things sometimes don't go quite how they should.

This week I'll be dealing with some of your questions and answers about bulletin boards.

Firstly, Mr G N Porilo has one big problem. He has joined Prestel, but cannot seem to log on in the conventional way. Instead he is using a special 300/300 baud London number. This must be extremely annoying, as this host computer converts all graphics characters into dots and the display is monochrome.

Since the main reason most people use viewdata systems is for the colour and graphics and loss of them, coupled with using the reduced speed of 300/300 must be most antagonising. I will try to suggest what the problem is along with a solution, though to be quite frank, I've never known anyone with this trouble.

The first thing to do is ensure that your software is set to Viewdata emulation. This could have one of many names, including; Viewdata, Prestel, Teletext, colour and even CBM! If you are not set to the correct emulation (ie, Ascii rather than Viewdata), then characters will be interpreted by your computer wrongly. This is because each character is given a reference code and Ascii (American Standard Code for Information Interchange) uses a different code for each character to viewdata. The main reason is that viewdata has a different set of characters (control codes, graphic codes etc).

If your software cannot emulate viewdata, new software will be needed. One point to note is that many bulletin boards now work with both viewdata and Ascii emulations. They work out which you are using by asking you to press return at the start.

As viewdata uses a # as a return character and Ascii uses control-M, the host computer can read this in and instantly tell what emulation you are using. Thus it is essential that if you are using viewdata, you enter a # as your return character.

The next thing to ensure is that you are at the correct baud rate. Silly as it may seem, 1200/75 is still sometimes written as 75/1200 and 75/1200 written as 1200/75. If you are not careful, you may end up using the wrong baud rate even though it's written as though it were the correct one. For viewdata you want 1200/75 – receive 1200, transmit 75. If the modem cannot handle 1200/75, a new modem will be needed.

Next, one major problem could be a wrong protocol. The data protocol for Prestel/Telecom Gold is 7E1 and for other Ascii services it is *usually* 8N1. Other formats, such as 7E2 and 8I1 do exist, but are uncommon. 7E1 refers to data word size of seven bits, even parity and one stop bit. 8N1 is eight bit data word, no parity and one stop bit.

Word size can be any of 5, 6, 7 or 8 bits, parity E, O, N, I, S or R and there could be 1, $1\frac{1}{2}$ or 2 stop bits. The parities are E: Even; O: Odd; N: None (there is no partiy – 8 bit data word); I: Ignore (worth trying in many situations); S: Set (parity bit is 1); R: Reset (parity bit is 0).

It's not necessary to understand how parity works and I have explained it briefly before. As it says above, try parity of Ignore if you do not know the parity.

"The first thing to do is ensure that your software is set to Viewdata emulation. This could have one of many names"

To use Prestel, you should ensure that your software and modem are set as follows: Speed: 1200/75; Parity: 7E1; Emulation: Viewdata.

You should also ensure that the modem is in originate mode (if there is no option to change from originate to answer assume you are in originate, and that you have the correct telephone number. In this case, I would doubt the number is wrong, as Prestel send it to you with your password and are unlikely to get it wrong (Prestel in London is 618).

It's back to parity for Phil Borman's problem. When I explained parity in full some weeks ago, I only briefly mentioned Mark and Space parities and said you are unlikely to come across them. Phil uses *QCode* software on the QL and the parities offered are: Even, Odd, Mark and Space. I still hold that you will be very unlikely to use them.

Mark and Space are other names for Set and Reset and basically give a parity bit of 1 or 0 respectively. The only parity on *QCode* which is used in normal communications is Even. The most common parity, None (as used in 8N1), is not listed and Mr Borman understandably wants to know how to obtain it. I think the answer lies in setting the software to eight data bits and one stop bit. Since with eight bits, it is theoretically impossible to have a parity other than N on a home micro, the software will probably set to no parity automatically on selection of eight bits. Since most home micros are 8-bit computers, they can only handle eight bits of data at a time.

The inclusion of a parity bit would result in nine bits of data per character which would certainly confuse the average computer. Even 16/32-bit computers like the Amiga do not use parity with eight bit data for similar reasons.

Smart readers will be thinking 'What about the start and stop bits??' Start bits are used to tell the computer when the data for the character will be transmitted and a stop bit represents the end. These are used for synchronisation and are stripped off from the required bits (the eight bits, or seven bits and parity) by the receivng software. If everything is set correctly then it should happen automatically, without you even knowing it.

So, to answer the question, set to eight bit data word and try it. If it does not work, the software cannot handle 8N1 and new software is needed.

A new BB called Hybrid is now online. 1200/75, and maybe 300/300, is what Lee Nickeas told me on behalf of the sysop, Simon Lowe. 8N1, on the phone number 0602-609403.

The hours for this board are a bit complicted, so read the next bit carefully.

Friday	0830 →	1630	2200 →
Saturday	0830		2200 →
Sunday	0930		1100 →
Monday	0630		

You can ring up at any other time and 'book' the board. If you do this, the sysop will put it on-line at the time you request for your call. It's a bit like the old ring 'n' request boards that used to be popular.

Finally, another board. This one is newish but has been on-line for a few months. In Nottingham, it's called Sherwood Forest BBS ("What else?" says the sysop, Kevin Lindley) and can be reached 24 hours a day on 0602 397113. 1200/75 and 300/300, ASCII, 8N1. Some of the features/SIGs include adventures, Amiga, BBC, E-Mail, 'network'(?) and communications.

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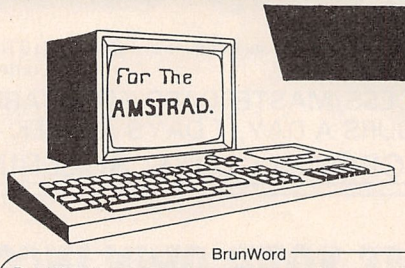

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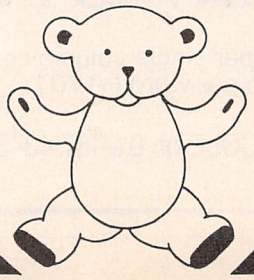

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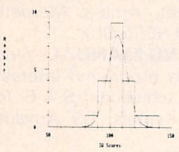

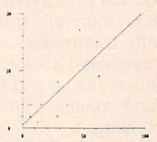

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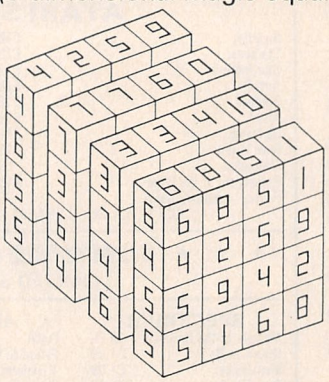

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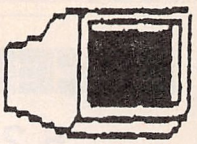

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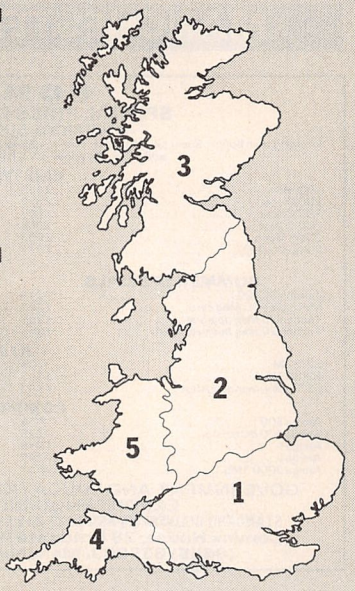

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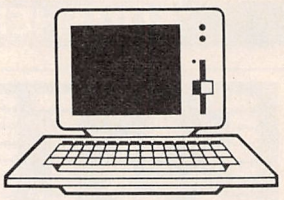

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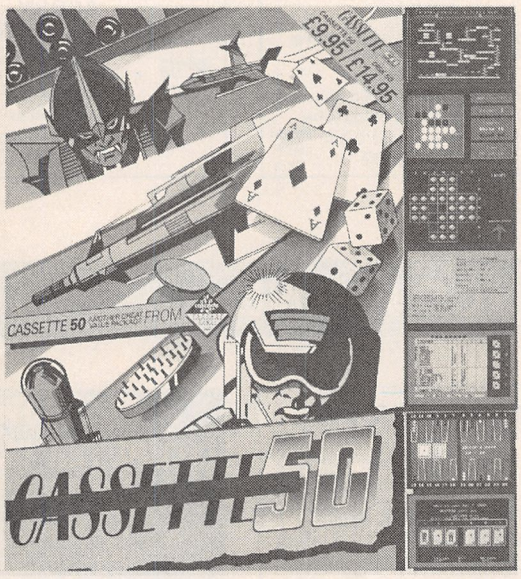

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Your complete guide to all the software released this week

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Program *Boulder Dash* **Type** Arcade **Price** £2.99 tape, £4.99 disc **Supplier** Prism Leisure, Unit 1, Baird Road, Enfield, Middlesex EN1 1SJ.

Program *Mission Genocide* **Type** Arcade **Price** £1.99 **Supplier** Firebird, 64–76 New Oxford Street, London WC1A 1PS.

Would you believe it, another shoot 'em up.

Program *Convoy Raider* **Type** War Game **Price** £9.99 tape, £14.99 disc **Supplier** Gremlin Graphics, Alpha house, 10 Carver Street, Sheffield S1 4FS.

Atari XL/XE

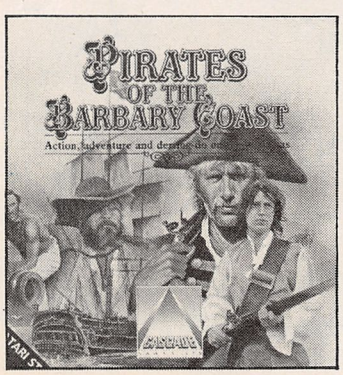
Program (Atari 800 only) *Pirates Of The Barbary Coast* **Type** Simulation **Price** £9.95 disc only **Supplier** Cascade Games, Harrogate, North Yorkshire.

Program *Boulder Dash* **Type** Arcade **Price** £2.99 tape, £4.99 disc **Supplier** Prism Leisure, Unit 1, Baird Road, Enfield, Middlesex EN1 1SJ.

Program *Boulder Dash 2* **Type** Arcade **Price** £2.99 tape, £4.99 disc **Supplier** Prism Leisure, Unit 1, Baird Road, Enfield, Middlesex EN1 1SJ.

Atari ST

Program *Pirates Of The Barbary Coast* **Type** Simulation **Price** £12.95 disc **Supplier** Cascade Games, Harrogate, North Yorkshire.



BBC B/B+

Program *The Hunt – Search For Shauna* **Type** Adventure **Price** £9.95 disc **Supplier** Robico Software, 3 Fairland Close, Llantrisant, Mid Glamorgan CF7 8QH.

See panel for comment.

Electron

Program *Stryker's Run* **Type** Arcade **Price** £9.95 tape only **Supplier** Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX.

The original version of this was one of the best arcade games released for the BBC. It's now available for the Electron and probably an essential buy.

Program *Panik!* **Type** Arcade **Price** £1.99 **Supplier** Atlantis Software, 28 Station Road, London SE25 5AG.

Slightly less essential, but still worth buying because it's so cheap and you may not have an Electron version of this particular game. This is a version of the old arcade game where you run up and down ladders and across platforms, digging holes to trap the monsters that are chasing you.

Program *Zolyx* **Type** Arcade **Price** £1.99 **Supplier** Firebird, 64–67 New Oxford Street, London WC1A 1PS.

Commodore 16/ Plus 4

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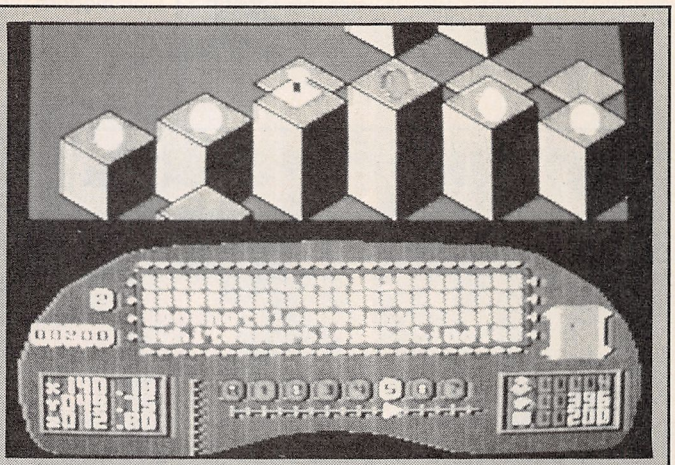


I always worry about having to review Martech games because I generally either like them a lot or can't stand them at all. Fortunately, *Catch 23* falls into the first category, despite being one of those wire frame graphics jobs that have been done to death of late.

The game is set on an island where a top secret weapon, the CK 23 is being developed. It is your task to penetrate the development complex, steal the plans for the CK 23 and then sabotage a nuclear reactor in order to destroy the entire island.

You've been dropped onto the island by parachute with only a few hours to complete your mission. It is 2200 hours so it's dark, but fortunately you are equipped with a sightloss image enhancer which gives you a 3D image of the island around you (hence the wire-frame graphics), as well as a sophisticated information display that gives you a readout on your status, and on military activity in the immediate area.

You won't be surprised to hear that this activity is mostly armed patrols, both foot soldiers and armoured tanks, that are searching for intruders and will shoot on sight. The island itself is divided into 14 zones, some containing marsh or forest, whilst in others there are deserted villages or military facilities.

The size of the island makes it impractical to cover by foot, but there are shuttles connecting various points which can save you a lot of time.

In any location you can examine the buildings by entering Investigation mode, which will let you know if it is possible to enter or not, and inside there may be items such as explosives or spare ammunition that can help you complete your mission. Another option is Bomb mode, which is fairly self explanatory, I think.

There is also a resistance group on the island, but they have gone underground so you'll need to look for information about them as you explore.

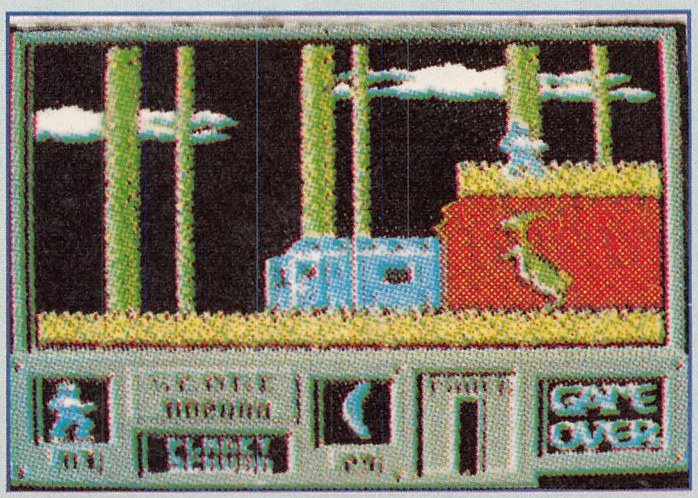
Obviously in a game of this sort the quality of the graphics is important, and thankfully Martech have managed to avoid the jerkiness that affects some wire-frame games, though to do this they have had to slow things down just a little.

If you're looking for a super-fast shoot 'em up then *Catch 23* probably isn't the game for you, but if you want something that will take a bit of thought and keep you absorbed while we're all waiting for the summer to come back, then it might well be worth a look.

Cliff Joseph

Hall of Fame

Program *Game Over* **Type** Arcade **Price** £7.95 Spectrum tape, £8.95 Commodore tape, £12.95 disc, £8.95 Amstrad tape, £14.95 disc **Supplier** Ocean, 6 Central Street, Manchester M2 5NS.



GAME OVER!

Another addictive shoot 'em up from Imagine that we've become hooked on . . .

The first time I looked at a version of *Game Over* (for the Amstrad) I wasn't wildly impressed. The graphics were quite nice, but there didn't seem to be anything special about it that made it stand out from all the other shoot 'em ups.

It also appeared to suffer from one of my big bugbears, the 'go back to the start each time you die' syndrome, which means that you spend hours and hours going through the same old screens over and over again, just to spend ten seconds on a new screen before you die and then have to start all over again.

Then, finished versions of the game arrived for Spectrum, C64 and Amstrad machines and somehow or other I found myself getting hooked on the Spectrum version (isn't life strange sometimes?).

It just goes to show how misleading pre-production copies of games can be, especially when the instructions haven't been written . . .

Imagine's computer games have evolved to the point where the instruction sheet now retains only a vestigial plot, which in this case goes along the lines of:

You, Arkos, have to kill the mad queen, Gremla.

That's it. As usual though, before you can reach this obligatory bad person you have to fight your way past an almost endless stream of monsters and mechanical defences.

There are two parts to the game. The first, on the planet of Hypsis consists of 25 screens which you have to travel through by blasting your way across the screen from left to right.

This planet is guarded by robots, green monsters, laser turrets, gunships, a large green thing called a Giant Orko, and, the final obstacle, three giant robots.

None of these are instantly fatal, but if they shoot at you or come into contact with you they all drain different amounts of energy. You can recharge your energy, as well as your weapons by shooting your way into the barrels located at various points along the way.

The landscape that you travel across consists of a variety of platforms, pits, and lifts, and you can run, jump or crouch as you attempt to dodge the various obstacles in your way.

Once I'd got a finished copy of the instructions I realised that you don't always have to go back to the start when you get killed. You do have to do this during the first eleven screens, but after defeating the Orko on screen eleven new life continues from that point.

If you complete the first part of the game you'll be given the code word that allows you into part two.

The planet Sckunn is a bit more complicated. Instead of being a simple left-to-right landscape, it consists of two areas, the palace and the forest, the different levels of which are interconnected both horizontally and vertically.

The monsters on this planet are a bit more dangerous, the final one being the Giant Guardian that can absorb tons of laser blasts and has to be destroyed one bit at a time before letting you reach the end of the game.

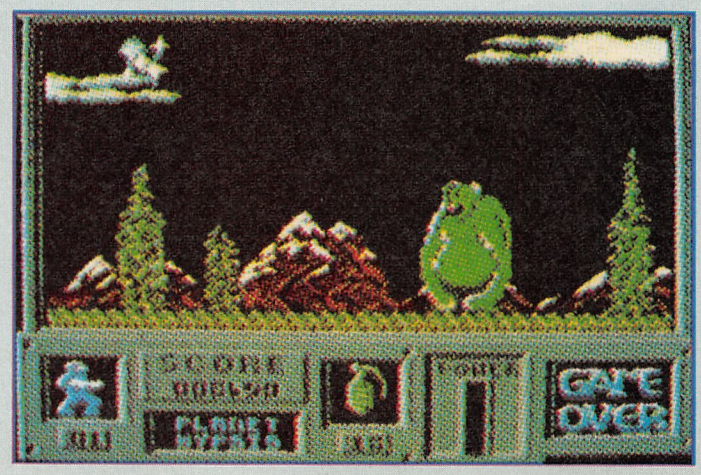
Strangely enough, out of the three versions that I've played, the Spectrum is the best. The C64 version is a bit sluggish, while the Amstrad one is only slightly faster, though it does give perhaps the best graphics of the three.

However, despite the least attractive graphics (and some pretty bad attribute problems which result in Green Monsters that are often any colour except green), it's been the Spectrum version that I keep going back to in an attempt to finish the game off.

It's clearly the fastest of the three, and the one with the smoothest response to your controls.

The difference between the three versions is quite marked in fact, so that while the Amstrad and C64 versions are outstanding, shoot 'em ups, it's the Spectrum one that really ought to be a hit.

Cliff Joseph



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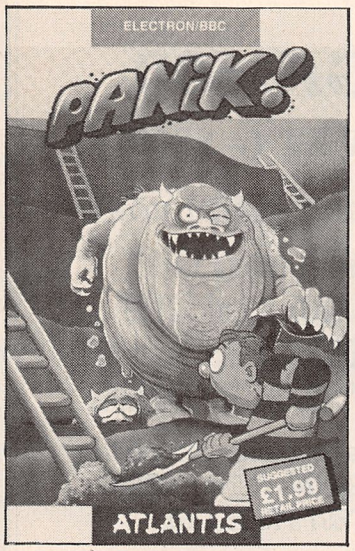
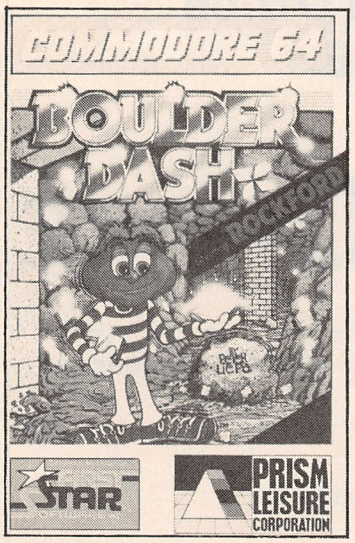


Commodore 64

Program *Station Fall* **Type** Adventure **Price** £24.99 disc **Supplier** Infocom/Activision, 23 Pond Street, London NW3 2PN.

The latest adventure from Infocom, and they're back on top form for the first time since *Hitch-Hiker* (and by the same author). *Station Fall* is the sequel to *Planet Fall,* and again features Floyd The Droid as your faithful companion, as you attempt to unravel the mystery of a deserted space station.

Program *Boulder Dash* **Type** Arcade **Price** £2.99 tape, £4.99 disc **Supplier** Prism Leisure, Unit 1, Baird Road, Enfield, Middlesex EN1 1SJ.



Program *Boulder Dash 2* **Type** Arcade **Price** £2.99 tape, £4.99 disc **Supplier** Prism Leisure, Unit 1, Baird Road, Enfield, Middlesex EN1 1SJ.

Program *Black Magic* **Type** Arcade **Price** £9.99 tape, £14.99 disc **Supplier** US Gold, Units 2/3, Holford Way, Holford, Birmingham B6 7AX.

Program *Decathlon* **Type** Sports Simulation **Price** £1.99 **Supplier** Firebird, 64-76 New Oxford Street, London WC1A 1PS.

An old Activision title re-released by Firebird, containing ten sports events for up to four players. Sports games have been done to death recently, but this one was very popular when it was first released and is good value at its new price.

Program *Death Race* **Type** Racing Simulation **Price** £1.99 **Supplier** Atlantis Software, 28 Station Road, London SE25 5AG.

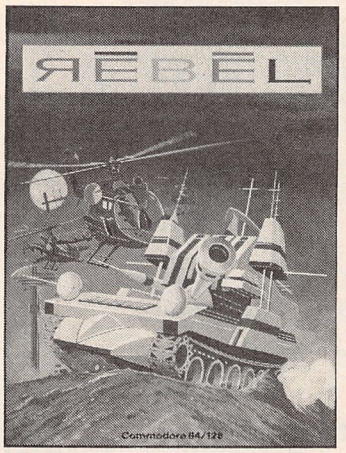
A sort of budget version of *Pole Position.* Not as sophisticated as some other racing games, but reasonable for the price.

Program *Re-Bounder* **Type** Arcade **Price** £9.99 tape, £14.99 disc **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS.

Sequel to Gremlin's *Bounder* game. You control a ball bouncing over a landscape covered in traps and obstacles and have to reach safety at the end of the course. It's a bit more complicated than *Bounder,* as you can now fire back at some of the airborne hazards, and you have to touch down on pumping stations form time to time to keep the ball's air pressure up. I found both *Bounder* and *Re-Bounder* difficult to play as I couldn't get to grips with the bouncing motion, but I know that a lot of people found *Bounder* very addictive and they should enjoy the sequel just as much.

Re-Bounder will only be available on the 64, as there are no conversions planned at the moment.

Program *Rebel* **Type** Arcade **Price** £9.95 **Supplier** Virgin Games, 2-4 Vernon Yard, Portobello Road, London W11 2DX.



Program *Pirates Of The Barbary Coast* **Type** Simulation **Price** £9.95 disc **Supplier** Cascade Games, Harrogate, North Yorkshire.

Program *Convoy Raider* **Type** War Game **Price** £9.99 tape, £14.99 disc **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS.

IBM PC and Compatibles

Program *K-Data* **Type** Database

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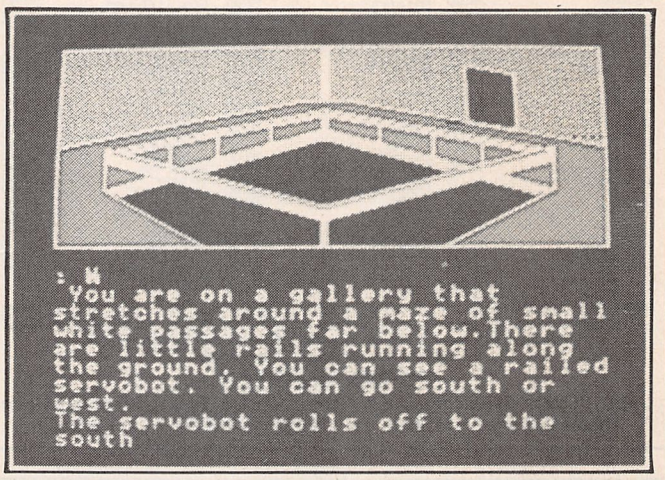

This is almost a brilliant game. *Pile Up!* is on the Reaktor label, and while it doesn't quite live up to its potential it's still quite an interesting novelty.

The idea behind it is that on a faraway planet there is a large chessboard-like grid, and resting on some of the squares of this grid are strange marbles which are a valuable source of power. But instead of being a simple flat surface this grid is made out of columns which rise up and down at random, giving the landscape the appearance of a whole series of skyscrapers of different heights.

It is your task as a marble pilot (who writes this stuff?) to fly onto the grid in your skimmer and collect as many marbles as you can, transporting them to the power transfer station nearby. The height of the columns affects the power levels in the marbles, so you have to collect them in a certain order, and the marbles themselves are highly explosive so that you have to fly around the columns on the grid very carefully.

There's not much more to it than that, and although the plot might sound a bit odd the action is more or less a matter of flying back and forth across the grid. But what made this fairly limited scenario quite enjoyable to play is the responsiveness of your little skimmer.

The joystick controls the direction of travel, and the fire button controls your altitude, and the skimmer swoops and swerves around all the columns like Chris Reeves in a *Superman* film (accompanied by suitably whooshy sound effects). It's such a smooth action that flying across the grid is fun even if you're just flying back and forth repeatedly.

It's a pity that the programming behind *Pile Up!* hasn't been put into a more ambitious game, because if the skimmer was a bit larger and the landscape were more extensive and populated with a few megalomaniac aliens you'd have the makings of a good shoot 'em up. As it is, *Pile Up!* is an interesting idea, but not quite a chart-topper.

Cliff Joseph

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◀ continued from page 43

Price £49.95 **Supplier** Kuma Computers, 12 Horseshoe Park, Pangbourne, Berkshire RG8 7JW.

Database program that is data-compatible with Kuma's own K-Spread 2, K-Graph 2 and K-Word 3.

Program *Flying Start* **Type** Database **Price** £69.95 **Supplier** Mitre Software, International House, 26 Creechurch Lane, London EC3A 5BA.

Easy to use database, the cowt of which includes three-month subscription to a users' help-line.

Program *Boulder Dash* **Type** Arcade **Price** £9.95 **Supplier** Prism Leisure, Unit 1, Baird Road, Enfield, Middlesex EN1 1SJ.

See Spectrum listing for comment, but bear in mind that the PC version costs £9.95.

Program *Boulder Dash 2* **Type** Arcade **Price** £9.95 **Supplier** Prism Leisure, Unit 1, Baird Road, Enfield, Middlesex EN1 1SJ.

Spectrum

Program *Ten-Pin Challenge* **Type** Bowling Simulation **Price** £1.99 **Supplier** Atlantis Software, 28 Station Road, London SE25 5AG.

Program *Oriental Hero* **Type** Arcade **Price** £1.99 **Supplier** Firebird, 64–76 New Oxford Street, London WC1A 1PS.

Program *Black Magic* **Type** Arcade **Price** £8.99 **Supplier** US Gold, Units 2/3, Holford Way, Holford, Birmingham B6 7AX.

Program *River Raid* **Type** Arcade **Price** £1.99 **Supplier** Firebird, 64–76 New Oxford Street, London WC1A 1PS.

Gosh, to think that *River Raid* is still around after all these years. It does look a bit dated but it's still addictive in a simple sort of way.

Program *Satcom* **Type** Simulation **Price** £1.99 **Supplier** Atlantis Software, 28 Station Road, London SE25 5AG.

A 'hacking' game, in which you have to hack into the computer system of an out-of-control laser satellite and neutralise it before it fries everyone on the planet below. An interesting idea for a budget game, and it makes a difference from all those cheap shoot 'em ups. One of Atlantis' better budget releases.

Program *Boulder Dash* **Type** Arcade **Price** £2.99 **Supplier** Prism Leisure, Unit 1, Baird Road, Enfield, Middlesex EN1 1SJ.

The Rockford coin-op game is about to be released in the arcades, so Prism have re-released the two *Boulder Dash* games that introduced Rockford to the games playing world. They're both quite simple games in which you wander around a maze, trying to collect jewels and avoid the deadly falling boulders and other traps. Simple, but very addictive and good value as budget games (especially at £4.99 on disc).

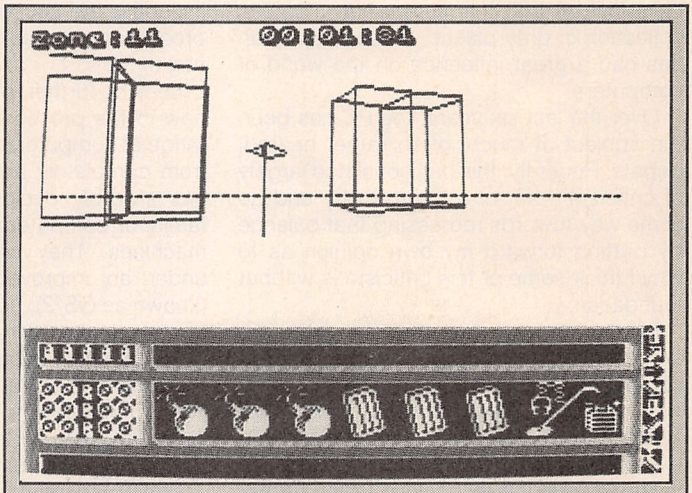
Program *Rebel* **Type** Arcade **Price** £9.95 **Supplier** Virgin Games, 2–4 Vernon Yard, Portobello Road, London W11 2DX.

Program *Convoy Raider* **Type** War Game **Price** £7.99 **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS.

A change of style for Gremlin, a Strategy game rather than arcade action. Defend your coastline from the enemy fleet.

Program *Catch 23* **Type** Arcade **Price** £7.95 **Supplier** Martech, Martech House, Bay Terrace, Pevensey Bay, East Sussex BN24 6EE.

See panel for comment.



Robico Software has a small but respectable catalogue of BBC adventures to its name, and its latest release is *The Hunt,* subtitled *Search For Shauna.*

You play the captain of an intergalactic spacecraft who is searching for Shauna, a kidnapped member of your crew. Your search has led you to a vast space station, where you dock and attempt to confront Shauna's abductor. Of course, the moment you dock things start to go wrong and you've immediatley got to solve your first problem. Your ship's hull has been damaged and you've only got about a minute to get out and into the safety of the space station.

Of course the station isn't that safe anyway, and as its main purpose is as a scientific research lab there is plenty of scope for a variety of baffling puzzles and strange characters (such as the Aggrodroid, whose purpose doesn't need much explaining).

The idea behind the game is sound enough, but there are a few points that make it a little frustrating at times. Always irritating are 'instant death' locations, such as the Customs area which you arrive at very early on in the game. As soon as you enter this location you are told that your 'scan' is positive and you are instantly sentenced to death. There is a way around it of course, but unless you've saved your game position it means going back to the start and retracing your steps. You really shouldn't have to do that too soon in the game, so you have a chance to get into the swing of things. The presentation is a bit sloppy, as the location text doesn't always scroll completely off screen when you enter a new location, which leaves odd bits of text floating at the top of the text area which you have to read through again to get to the new text. I suspect that *The Hunt* may have been written using Incentive's *Graphic Adventure Creator,* or *The Quill,* since this is the sort of standard presentational problem that these utilities can suffer from.

The game has a hundred or so locations, with extra graphics on the disc versions, and while it may not be in the infocom league, *The Hunt* is still a fairly competent adventure and my only real doubt about it is the £10 price tag (£12.95 on disc) which I think is a little high for a cassette-based game.

Cliff Joesph

CHARTS

Top Twenty

1	(1)	Paperboy	Elite
2	(4)	Barbarian	Palace
3	(5)	BMX Simulator	Code Masters
4	(2)	The Last Ninja	System 3
5	(3)	Milk Race	Mastertronic
6	(9)	Run for Gold	Alternative
7	(10)	Football Manager	Addictive
8	(8)	Four Great Games	Microvalue
9	(12)	Gauntlet	US Gold
10	(6)	Road Runner	US Gold
11	(7)	I Ball	Firebird
12	(18)	Feud	Bulldog
13	(–)	World Class Leaderboard	Access/US Gold
14	(15)	Six Pack	Elite
15	(19)	Destructo	Bulldog
16	(–)	Enduro Racer	Activision
17	(14)	Army Moves	Imagine
18	(–)	Leaderboard	Access/US Gold
19	(–)	F15 Strike Eagle	Microprose
20	(–)	180	Mastertronic

All figures compiled by Gallup/Microscope

Singing about PCs

The introduction of the IBM PC in 1981 was a milestone in the history of computing. Love it or hate it, it must be admitted that this somewhat infamous collection of grey plastic, metal and silicon has had a great influence on the world of computers.

Over the last six years, the PC has been the subject of much, often rather heated, debate. Recently, this has consisted largely of criticism. I am now going to try and go some way towards redressing that balance by putting forward my own opinion as to why I think some of this criticism is without foundation.

Firstly, I would argue that standards are an essential ingredient in the real world of computing. The standards of the PC along with MS-DOS have created a level of stability in an otherwise fast-moving and extremely volatile market. This has inevitably resulted in the technology falling further and further behind the current 'state of the art', but it has also meant that support for the PC has far exceeded anything available for any other micro. It is only through the right combination of both software and hardware that a particular task can be efficiently tackled.

Prevailing technology has overtaken the PC standard, but it hasn't succeeded in leaving it behind altogether. The MS-DOS operating system has gone through a number of revisions to cope with new innovations such as hard discs and $3\frac{1}{2}$ inch floppy discs. Indeed, new versions of the PC itself have been produced, such as the Amstrad PC, which has sold in large quantities.

The success of the Amstrad shows that people still want a PC, and that the market is constantly expanding to include new users, particularly towards the lower end of the market. At the same time, the so-called 'power users' who have larger and more complex tasks to carry out are being offered upgraded computers based on the PC standard, but using newer technology, including the successors to the Intel 8088 processor that was used in the first generation of PC's.

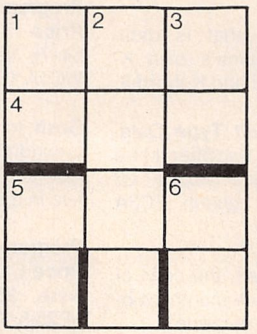
Looking further towards the future, IBM is now in the process of introducing its new range of computers known as the PS/2. Far from completely abandoning the PC, IBM has sensibly decided to develop a new family of computers based on the original machines. They will (eventually) operate under an improved version of MS-DOS (known as OS/2), but they are also capable of operating under the current version of MS-DOS and hence will run virtually all of the programs currently in existence for the PC. In other words, the PS/2 is a sensible step towards better technology without abandoning the current standard.

I am not trying to suggest that there is no place for innovation. There is a definite need for companies such as Apple and Atari who aim to produce their own alternatives to the PC standard, providing products which are invaluable to some people. What I am saying, though, is that older technology must coexist with the newer technology so that the serious business user can carry on using the equipment that s/he is familiar with and leave others to innovate. The newer technology will inevitably take over from the PC in years to come. However, with PC users numbering several million throughout the world, we cannot afford to be adopting new standards every couple of years just because something slightly better comes along. There must be a gradual transition from one level of technology to another. Basically, I am suggesting that evolution is always far less painful than revolution.

David Rawlinson

Puzzle No 268

In this crossnumber puzzle can you find the values for A, B, C and D, such that the grid can be filled?



Across

1) C^2
4) A^2 (digits reversed)
5) B^2

Down

1) A
2) D^2
3) B (digits reversed)
5) C
6) D

Solution to Puzzle No 263

Placing the joker at any of the positions 1, 2, 8, 10, 19, 36, 46, 51 or 53 will ensure that the joker is not the final card, irrespective of the number of cards transferred from the top to the bottom of the pack between each discarding.

The program works by toting each 'deal' in turn, in each case using a different number of transfers in the range 1 to 99.

An 'artificial' pack of cards is generated for each deal, this pack comprising a string of 53 Ascii characters in the range 65 to 117. This string is used in the same way as an actual pack.

Winner of Puzzle No 263

This week's winner is Angela Armstrong, of Abingdon, Oxon, who will receive £10.

Rules

The closing date for Puzzle 268 is August 19.

```
 10 DIM R(53)
 20 FOR A=1 TO 99
 25 PRINT A;"  ";
 30 D$=""
 40 FOR C=1 TO 53:D$=D$+CHR$(64+C):NEXT
100 FOR F=1 TO A
110 D$=MID$(D$,2)+LEFT$(D$,1)
120 NEXT
130 D$=MID$(D$,2)
140 IF LEN(D$)=1 THEN 200 ELSE 100
200 Z=ASC(D$)-64:R(Z)=R(Z)+1
205 PRINT Z
210 NEXT A
220 FOR F=1 TO 53
230 IF R(F)=0 THEN PRINT F
240 NEXT
```

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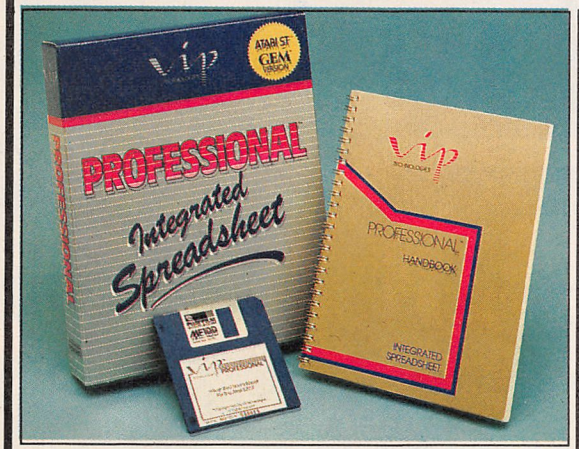

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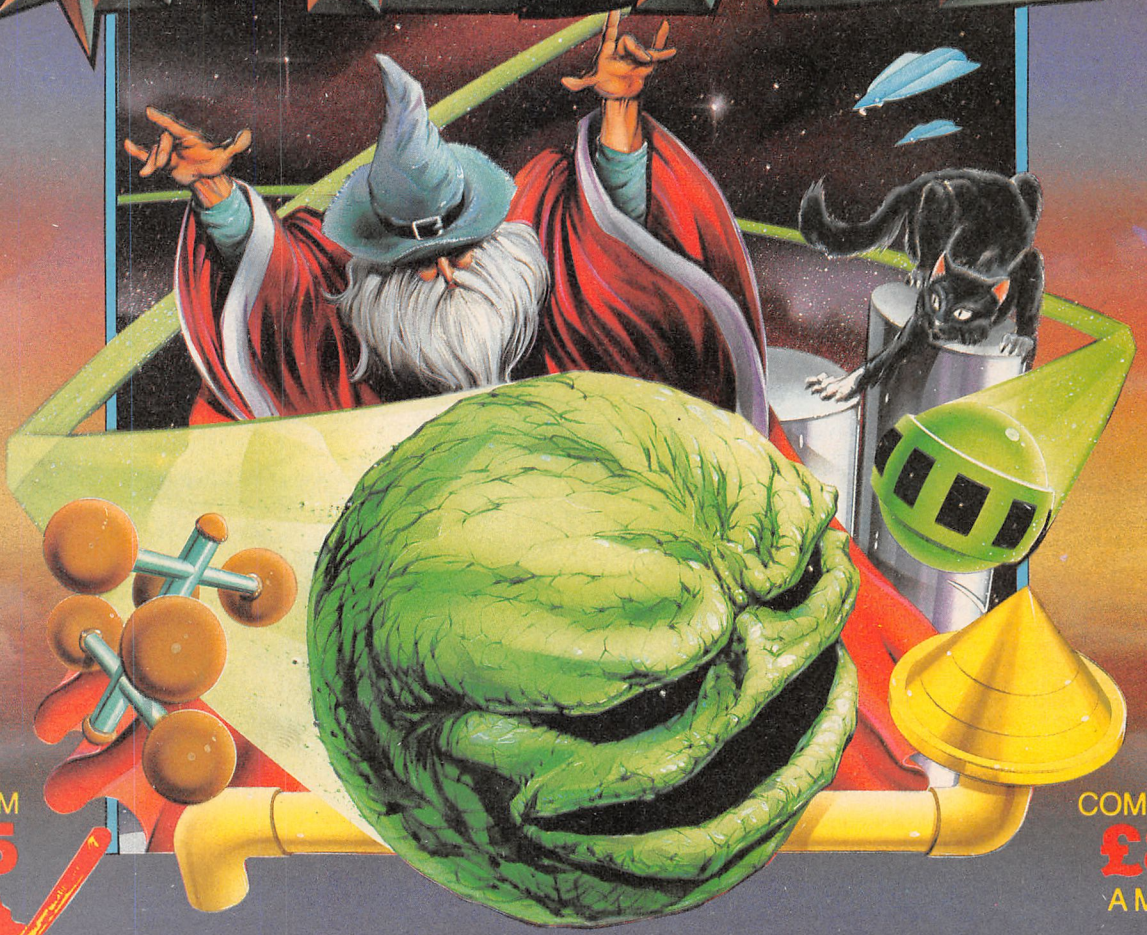

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